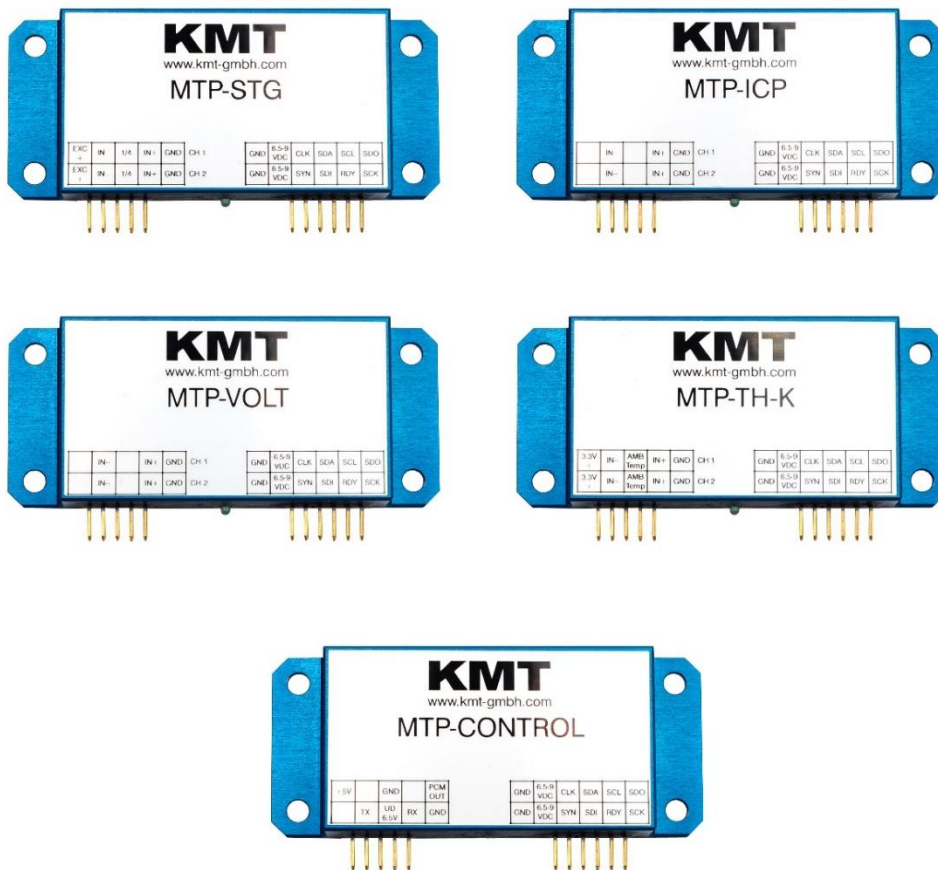


User Manual

MTP

Multi-channel telemetry system for rotating application, full software programmable with 16 bit resolution



INSTRUCTIONS FOR QUALIFIED PERSONNEL ONLY!

- 2 to 64 channel
- Signal bandwidth 0-24000Hz
- Inputs for STG, TH-K, ICP or VOLT
- STG - Auto Zero calibration
- 4V bridge Excitation
- Gain 125-250-500-1000-2000
- 16 bit ADC, simultaneous sampling
- Full software programmable
- Inductive or battery power
- Rugged housing, water protected
- Output analog +/- 10V
- Digital data interface to PC


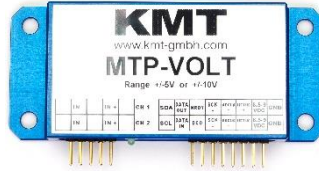
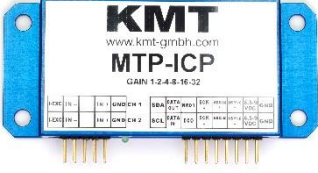



Safety notes

- The device should only be applied by instructed personnel.
- The power head emits strong magnetic radiation at 30-60 kHz to a distance of 300 mm. Therefore persons with cardiac **pacemakers** should **not work** with this device!
- Magnetic data storage media should be kept in a distance of at least 3m from the power head to avoid data loss. The same is valid for electromagnetic sensitive parts, devices and systems.
- Do **not place** the power head in the switched-on state **on metallic objects**, because this results in eddy currents which could overload the device and strong heat up small objects. Also the probe could be destroyed!
- No metallic objects, other than the disc-type coil, should be located in the air gap of the power head. The same applies to metallic parts within a radius of up to 50 mm in all directions.
- Do not use damaged or faulty cables!
- Never touch in the area between shaft and inductive head, the rotating shaft itself or rotor electronic contacts during operation!
- This is a "Class A" system suitable for operation in a laboratory or industrial environment. The system can cause electromagnetic interferences when used in residential areas or environments. In this case the operator is responsible for establishing protective procedures.

Short description:

The MTP telemetry is a small and flexible telemetry system for rotating applications. Each sensor module (2-channel) is equipped with signal conditioning, anti-aliasing filters, analog-to-digital converters and a digital output. All these up to 32 modules (=64 channels) will be controlled by MTP-Controller module. By this concept it's possible to install the acquisition modules close to the sensor to have short connections for the analog sensor lines. This avoids an undesired coupling of disturbances resulting in noisy signals. The interference insensitive digital outputs then can lead over wider distances of up to 25cm module to module. The MTP-Controller output is a PCM bit stream signal which can be modulated for emission by a transmitter module for distances of up to 0.1 with inductive telemetry transmission or up to 10m with radio telemetry transmission. Suitable for wireless data transmission rates of 312.5kbit/s up to 5000kbit/s

MTP acquisition modules (rotor side)

 <p>80 x 34 x 14 mm Weight 60 grams</p>	<p>MTP-STG-V3 Acquisition module for 2 strain gages Full, half >=350ohme and quarter bridge 350ohme Fixed excitation 4V DC Offset calibration by auto zero Manual offset shifting after auto zero Gain: 125-250-500-1000-2000 Test shunt-cal step Signal bandwidth 0Hz to 24000Hz* (*see table of cut-off-frequency) Resolution 16bit Accuracy <0.2% Powering: 6.5-9V DC Current consumption with full bridge 350 ohm 75mA Vibration: 5g Static acceleration: 3000g Shock: 10000g</p>	 <p>80 x 34 x 14 mm Weight 60 grams</p>	<p>MTP-VOLT-V3 Acquisition module for 2x high level inputs Range: $\pm 0,625V$, $\pm 1,25V$, $\pm 2,5V$, $\pm 5V$, $\pm 10V$ Signal bandwidth 0Hz to 24000Hz* (*see table of cut-off-frequency) +4V sensor excitation max. 20mA Resolution 16bit Accuracy <0.2% Powering: 6.5-9V DC Current consumption 60mA Vibration: 5g Static acceleration: 3000g Shock: 10000g</p>
 <p>80 x 34 x 14 mm Weight 60 grams</p>	<p>MTP-ICP® Acquisition module for 2 ICP sensors Current EXC. 4mA Gain: 1-2-4-8-16-32 Signal bandwidth 3 Hz to 24000Hz* (*see table of cut-off-frequency) Resolution 16bit Accuracy <0.2% Powering: 6.5-9V DC Current consumption 100mA Vibration: 5g Static acceleration: 3000g Shock: 10000g</p>	 <p>80 x 34 x 14 mm Weight 60 grams</p>	<p>MTP-TH-K Acquisition module for 2x TH-K <u>Inputs galvanic isolated</u> Range -50 to 1000°C, -50 to 500°C or -50 to 250°C Cut-off filter 30Hz (more on request) Resolution 16bit Accuracy: 0.2% at 1000°C range Powering: 6.5-9V DC Current consumption 110mA Vibration: 5g Static acceleration: 3000g Shock: 10000g</p>
	<p>MTP-Pt100/1000 (RTD) Acq. module for 2 RTD sensors Range -100 to 600°C, -50 to 300°C or -25 to 150°C Type Pt100 or Pt1000 Current EXC. 1mA Connection: 4-, 3- and 2 wire Sensor break detection Signal bandwidth 6Hz Resolution 16bit Accuracy <0.2% Powering: 6.5-9V DC Current consumption 60mA Vibration: 5g Static acceleration: 3000g Shock: 10000g</p>	 <p>80 x 34 x 14 mm Weight 60 grams</p>	<p>MTP-CONTROL Controller 1- 32 acquisition modules Output: PCM Programmable via LAN adapter Powering: 6.5-9V DC Current consumption 40mA, with LAN-setup adapter 140mA Vibration: 5g Static acceleration: 3000g Shock: 10000g</p>

Additional environmental

Operating Temperature -20 – +80°C
Storage Temperature -30 – +90°C
Humidity 100%

Signal bandwidth, sampling rates and delay time:						
Cut off frequency from anti-aliasing filter (-3dB) and sampling rate (red)						
Delay Time from Analog In to Analog Out (theoretical, brown)						
Bit rate	2 Channels	4 Channels	8 Channels	16 Channels	32 Channels	64 Channels
5000 kbit/s	-----	24000 Hz max. (62500 Hz) 1,6 ms	12000 Hz (31250 Hz) 2,3 ms	6000 Hz (15625 Hz) 4,5 ms	3000 Hz (7812.5 Hz) 8,9 ms	1500 Hz (3906.25 Hz) 17,9 ms
2500 kbit/s	24000 Hz max. (62500 Hz) 1,6 ms	12000 Hz (31250 Hz) 2,3 ms	6000 Hz (15625 Hz) 4,5 ms	3000 Hz (7812.5 Hz) 8,9 ms	1500 Hz (3906.25 Hz) 17,9 ms	750 Hz (1953.125 Hz) 35,7 ms
1250 kbit/s	12000 Hz (31250 Hz) 2,3 ms	6000 Hz (15625 Hz) 4,7 ms	3000 Hz (7812.5 Hz) 9,1 ms	1500 Hz (3906.25 Hz) 17,9 ms	750 Hz (1953.125 Hz) 35,7 ms	375 Hz (976.56 Hz) 71,5 ms
625 kbit/s	6000 Hz (15625 Hz) 4,7 ms	3000 Hz (7812.5 Hz) 9,4 ms	1500 Hz (3906.25 Hz) 18,3 ms	750 Hz (1953.125 Hz) 35,7 ms	375 Hz (976.56 Hz) 71,5 ms	190 Hz (488.28 Hz) 142,3 ms
312,5 kbit/s	3000 Hz (7812.5 Hz) 9,4 ms	1500 Hz (3906.25 Hz) 19,1 ms	750 Hz (1953.125 Hz) 36,3 ms	375 Hz (976.56 Hz) 71,5 ms	190 Hz (488.28 Hz) 142,5ms	95 Hz (244.14 Hz) 285 ms

Data frame:

For 4 Channels: 32 bit Barker Synch Code + 4x16 bit Data + 4x16 bit Data + 4x16 bit Data + 4x16 bit Data + 32 bit reserved

For 8 Channels: 32 bit Barker Synch Code + 8x16 bit Data + 8x16 bit Data + 32 bit reserved

For 16 Channels: 32 bit Barker Synch Code + 16x16 bit Data + 32 bit reserved

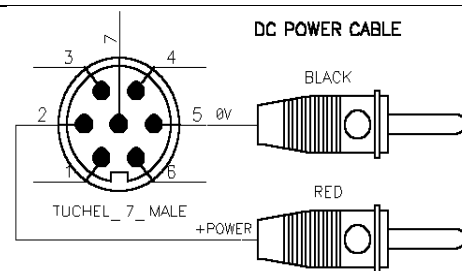
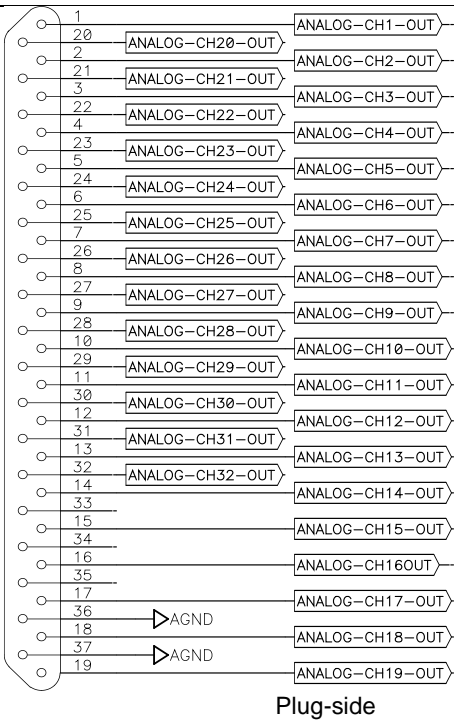
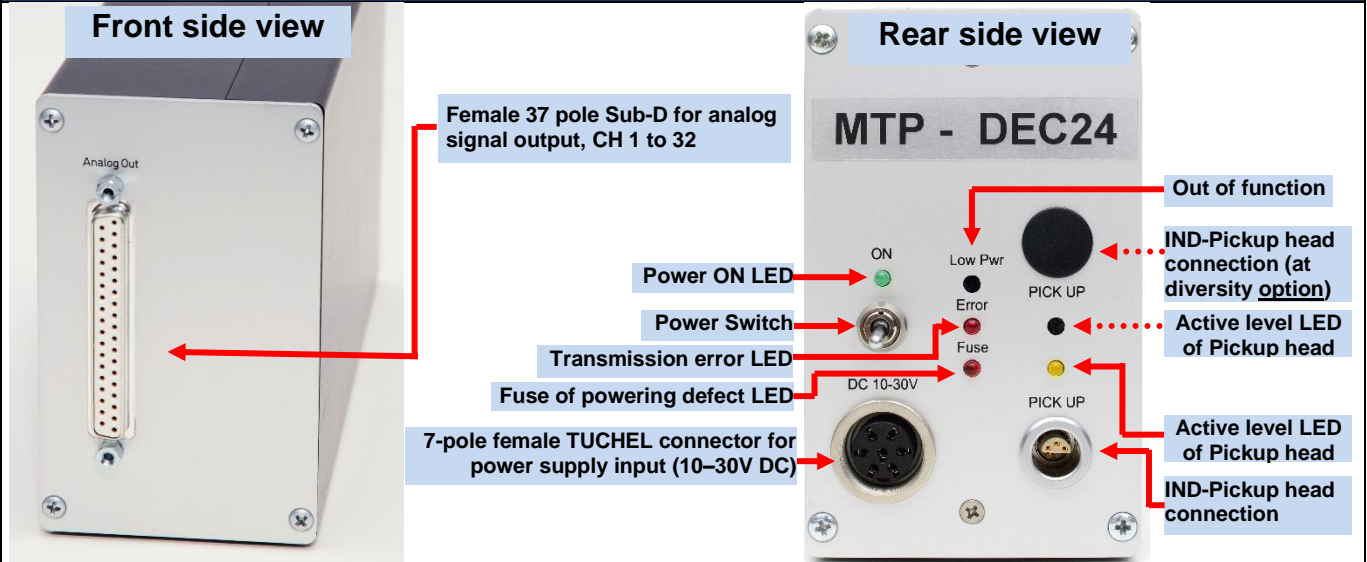
For 32 Channels: 32 bit Barker Synch Code + 16x16 bit Data + 32 bit reserved (Frame Nr.1 = CH1..Ch16) +
32 bit Barker Synch Code + 16x16 bit Data + 32 bit reserved (Frame Nr.2 = CH17..Ch32)

For 64 Channels: 32 bit Barker Synch Code + 16x16 bit Data + 32 bit reserved (Frame Nr.1 = CH1..Ch16) +
32 bit Barker Synch Code + 16x16 bit Data + 32 bit reserved (Frame Nr.2 = CH17..Ch32) +
32 bit Barker Synch Code + 16x16 bit Data + 32 bit reserved (Frame Nr.3 = CH33..Ch48) +
32 bit Barker Synch Code + 16x16 bit Data + 32 bit reserved (Frame Nr.4 = CH49..Ch64)

MTP-DEC4/8/16/24/32 with analog output via BNC (4/8) or Sub-D 16/24/32



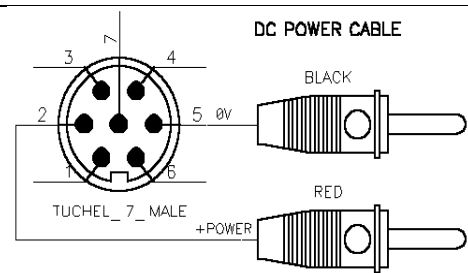
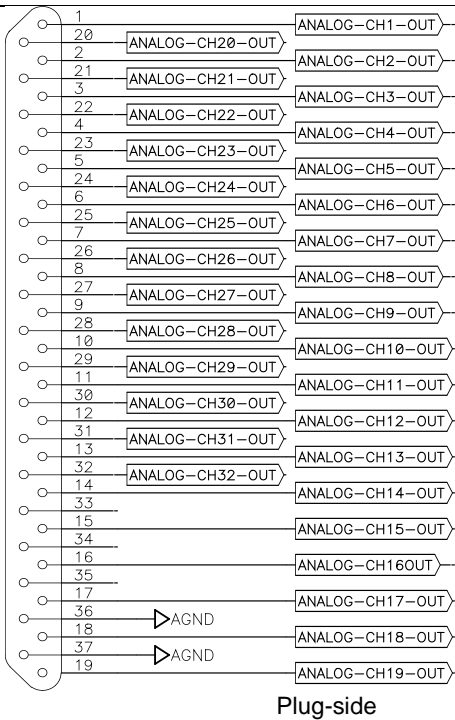
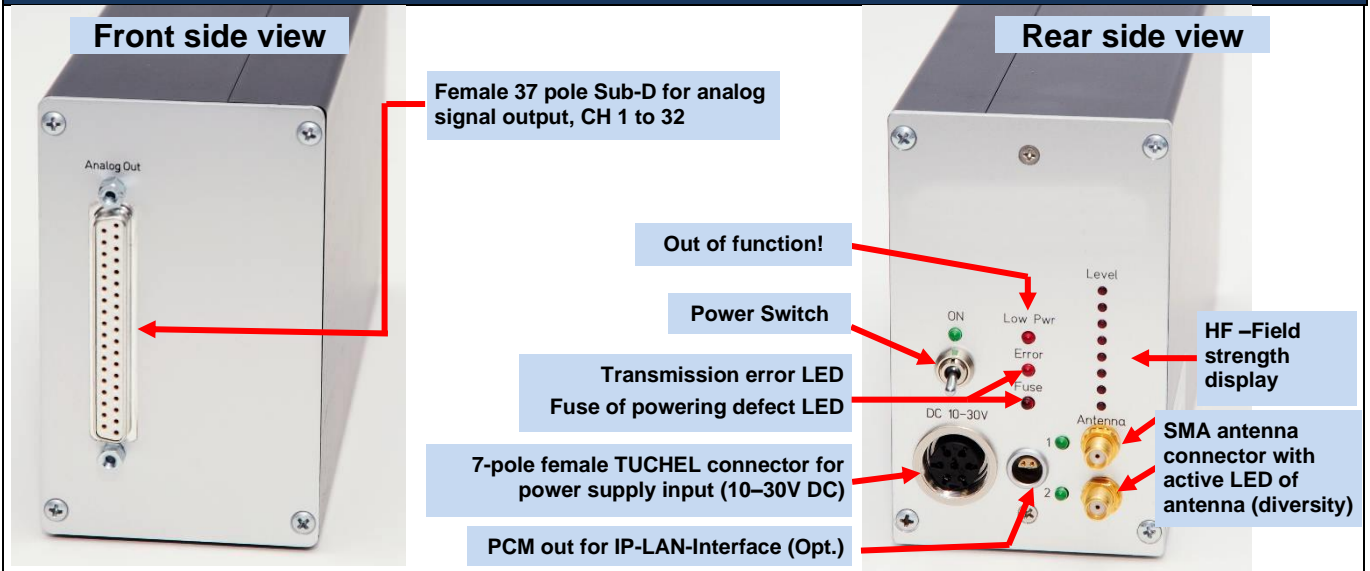
MTP-DEC8/16/24/32 Receiver unit for max 32 Channels output via 37 pol. Sub D (inductive transmission 45MHz version up to 5000Mbit)



MTP-DEC8/16/24/32 System Parameters:

Channel:	8, 16 or 32x +/-10V analog outputs via Sub-D male socket
Resolution:	16 bit D/A converter, with smoothing filter
Power supply input:	10-30 VDC, power consumption <24 Watt
Transmission:	Digital PCM Bi-Phase Format – FSK, receiver
Dimensions:	205 x 105 x 65mm
Weight:	1.25 kg without cables and antenna
Overall system accuracy between encoder input and decoder output:	<0.2% without sensor influences
Environmental	
Operating:	-20 ... +70°C
Humidity:	20 ... 80% not condensing
Vibration:	5g
Static acceleration:	10g in all directions
Shock:	100g in all directions

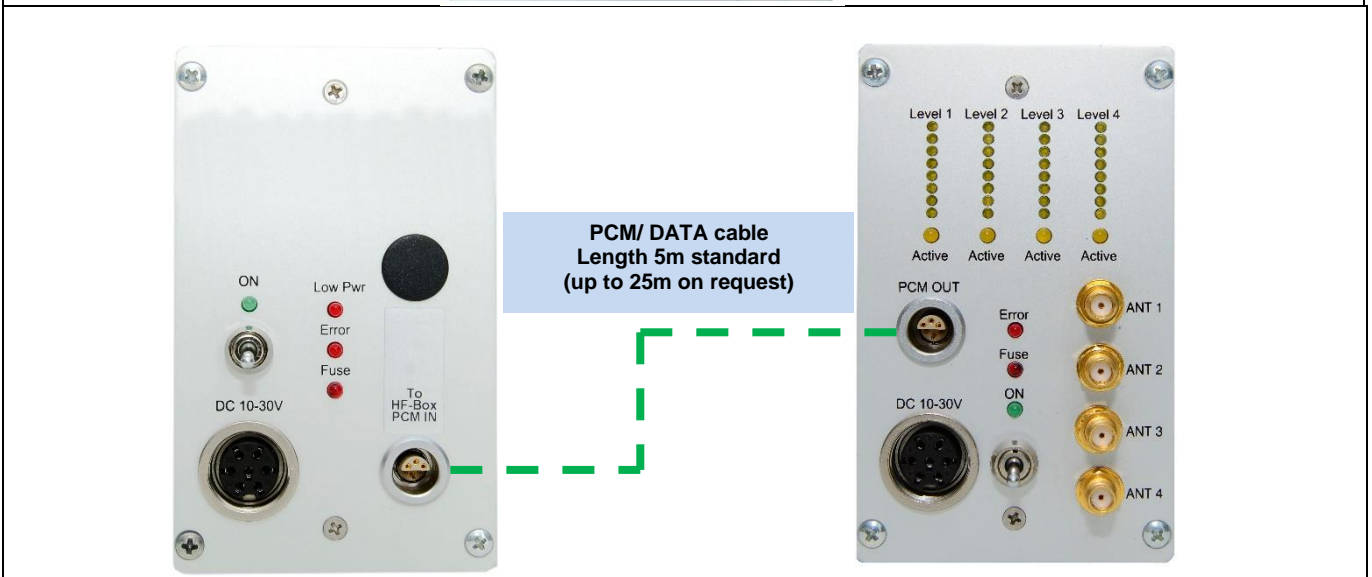
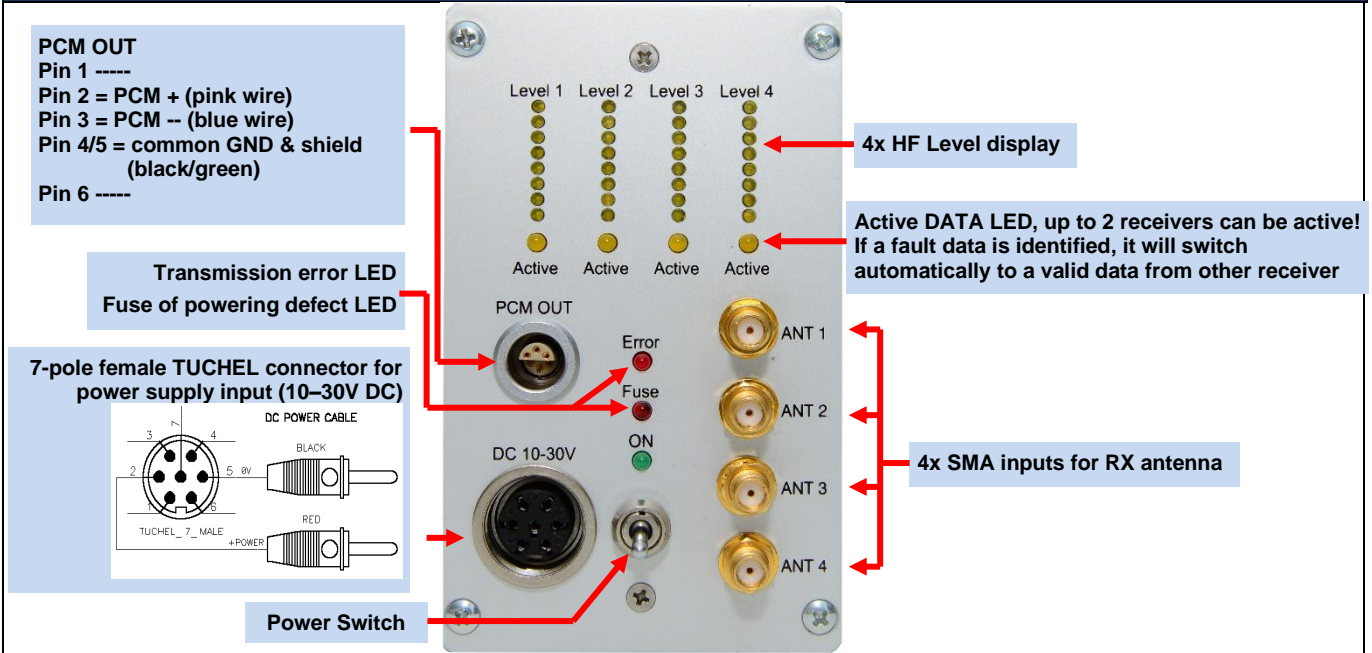
MTP-DEC8/16/24/32 Receiver unit for max 32 Channels output via 37 pol. Sub D (radio transmission version with diversity receiver 312.5-1250kbit)



MTP -DEC8/16/24/32 System Parameters:

Channel:	8, 16 or 32x +/-10V analog outputs via Sub-D male socket
Resolution:	16 bit D/A converter, with smoothing filter
Power supply input:	10-30 VDC, power consumption <24 Watt
Transmission:	Digital PCM Bi-Phase Format – FSK,
Dimensions:	205 x 105 x 65mm
Weight:	1.25 kg without cables and antenna
Overall system accuracy between encoder input and decoder output:	<0.2% without sensor influences
Environmental	
Operating:	-20 ... +70°C
Humidity:	20 ... 80% not condensing
Vibration:	5g
Static acceleration:	10g in all directions
Shock:	100g in all directions

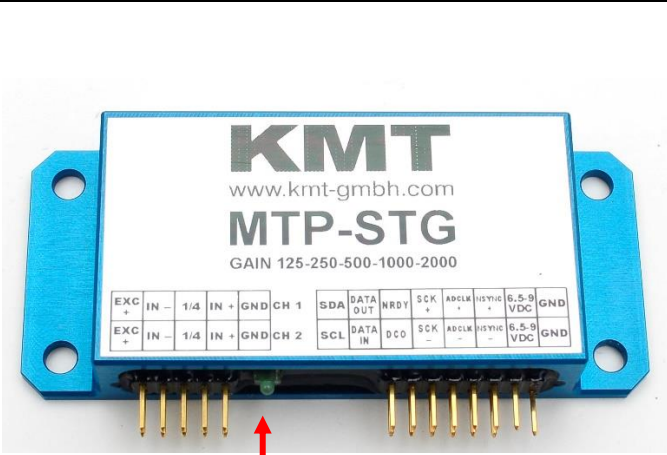
MTP-DEC32 Receiver unit for max 32 Channels output via 37 pol. Sub D (radio transmission version with HF BOX Quad with 4 receiver 1250 ... 5000kbit)



HF BOX Quad System Parameters:

HF receivers	4
Antenna connection	SMA
Output	PCM
Power supply input:	10-30 VDC, power consumption <24 Watt
Dimensions:	205 x 105 x 65mm
Weight:	1.050 kg without cables and antenna
Environmental	
Operating:	-20 ... +70°C
Humidity:	20 ... 80% not condensing
Vibration:	5g
Static acceleration:	10g in all directions
Shock:	100g in all directions

MTP-STG - Acquisition module for 2 channels strain gages (STG)



STG connection for 2 channels

Status LED ON = Error

Powering and digital bus I/O

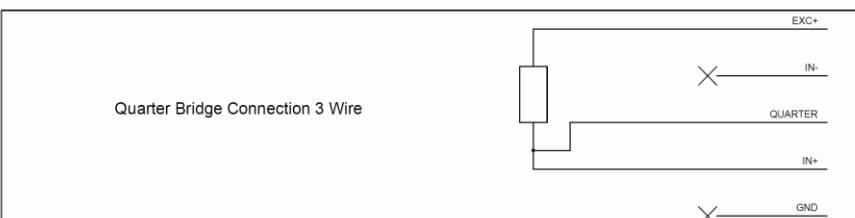
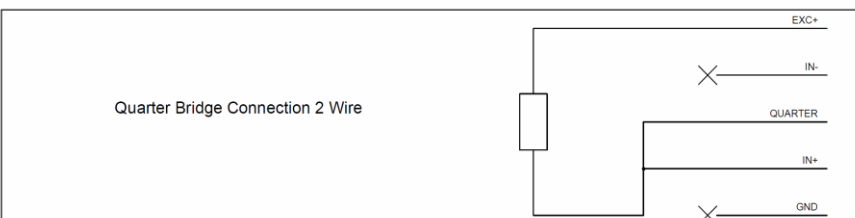
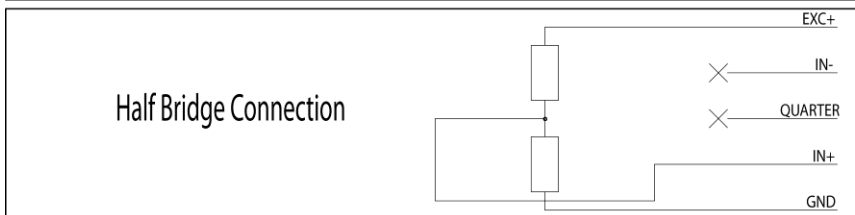
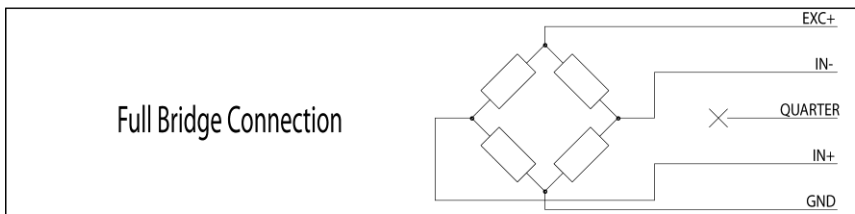
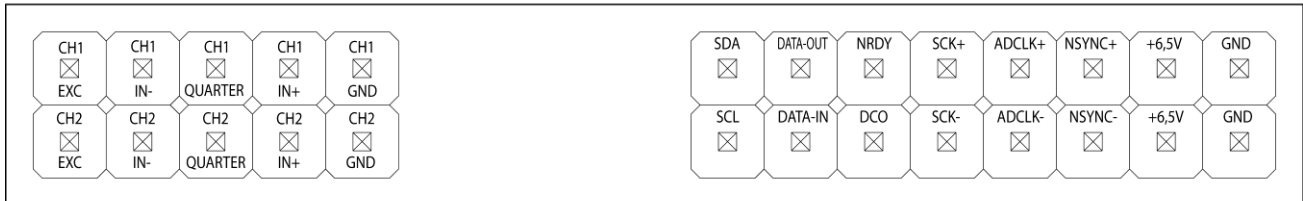
MTP-STG-V3

Acquisition module for 2 strain gages
 Full, half $\geq 350\Omega$ and quarter bridge 350Ω
 Fixed excitation 4V DC
 Offset calibration by auto zero
 Manual offset shifting after auto zero
 Gain: 125-250-500-1000-2000
 Test shunt-cal step (about 80% from measuring range at GAIN 2000) (shunt resistor = $88,7k \ 01\%$ _ between EXC+& IN+)
 Signal bandwidth 0Hz to 24000Hz*
 (*see table of cut-off-frequency)
 Resolution 16bit
 Accuracy $<0.2\%$
 Powering: 6.5-9V DC
 Current consumption with full bridge $350 \ \Omega$ 75mA
 Vibration: 5g
 Static acceleration: 3000g
 Shock: 10000g

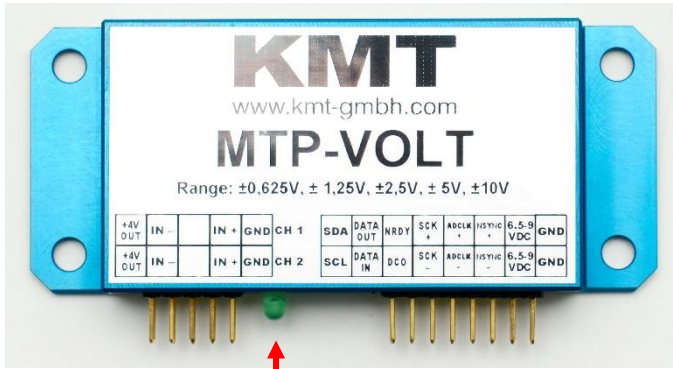
Gain and STG-Sensitivity (output +/-10V at decoder)

Gain 125 = +/-20mV/V
Gain 250 = +/-10mV/V
Gain 500 = +/-5mV/V
Gain 1000 = +/-2.50mV/V
Gain 2000 = +/-1,25mV/V

STG2 Modul Sensor and Bus Connections



MTP-VOLT - Acquisition module for 2 channels high level inputs



VOLT connection for 2 channels

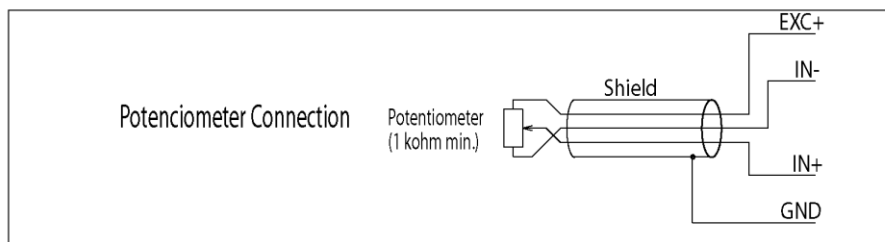
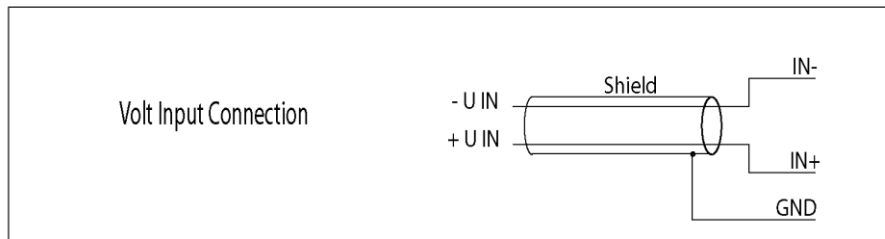
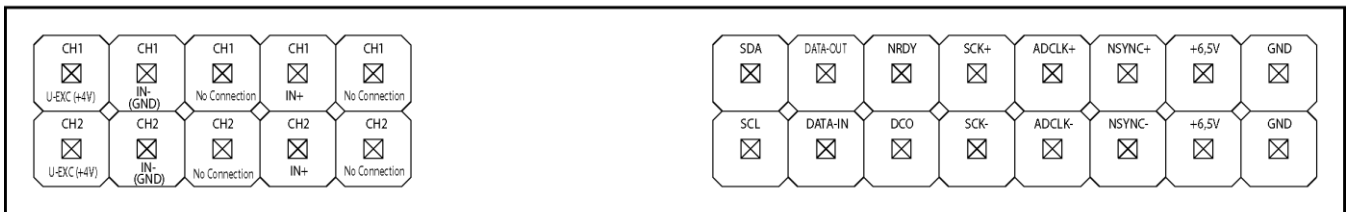
Status LED ON = Error

Powering and digital bus I/O

MTP-VOLT-V3

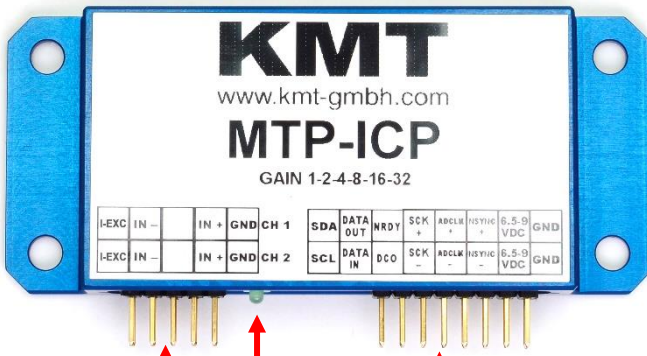
Acquisition module for 2x high level inputs
 Range: $\pm 0,625V, \pm 1,25V, \pm 2,5V, \pm 5V, \pm 10V$
 Signal bandwidth 0Hz to 24000Hz*
 (*see table of cut-off-frequency)
 Add. +4V sensor excitation **max. 20mA**
 Resolution 16bit
 Accuracy <0.2%
 Powering: 6.5-9V DC
 Current consumption 60mA
 Vibration 5g
 Static acceleration: 3000g
 Shock: 10000g

VOLT2 Modul Connection



Shield only for noisy environmental (GND)

MTP-ICP - Acquisition module for 2 channels ICP sensor



MTP-ICP®
 Acquisition module for 2 ICP sensors
 Current EXC. 4mA
 Gain: 1-2-4-8-16-32
 Signal bandwidth 3 Hz to 24000Hz*
 (*see table of cut-off-frequency)
 Resolution 16bit
 Accuracy <0.2%
 Powering: 6.5-9V DC
 Current consumption 100mA
 Vibration: 5g
 Static acceleration: 3000g
 Shock: 10000g

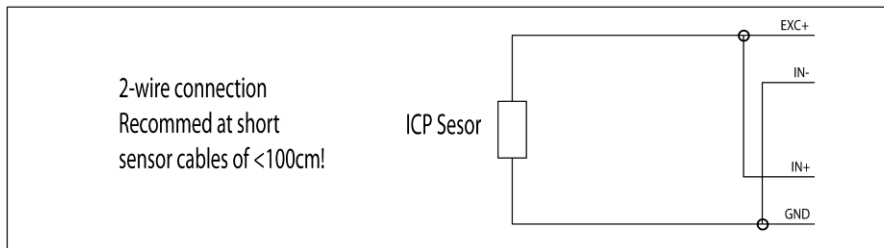
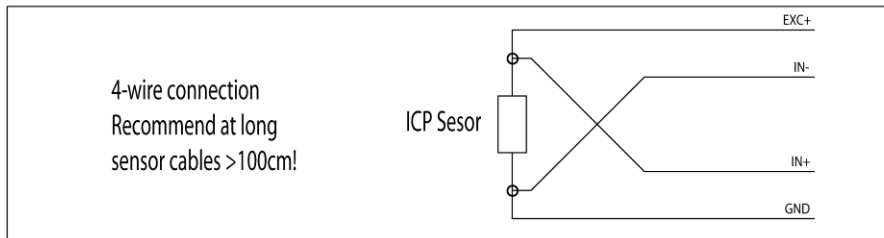
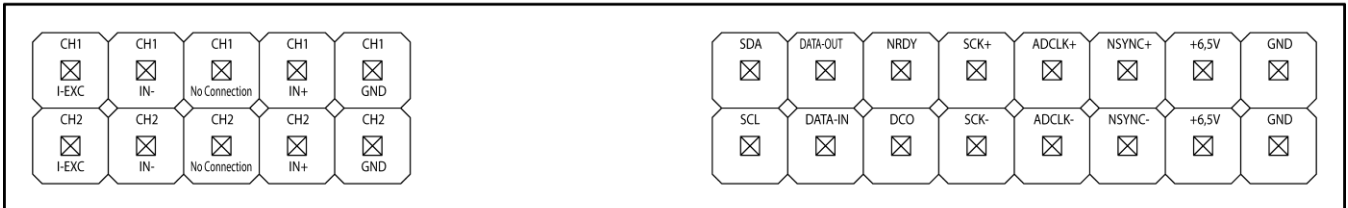
ICP connection for 2 channels

GND only for optional cable shield!

Status LED ON = Error

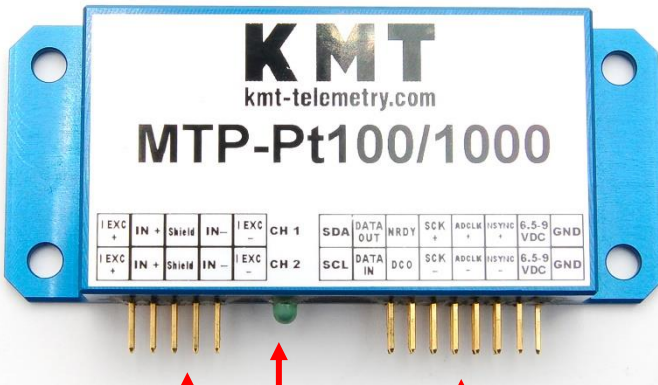
Powering and digital bus I/O

ICP2 Modul Sensor Connections



Shield only for noisy environmental (GND)

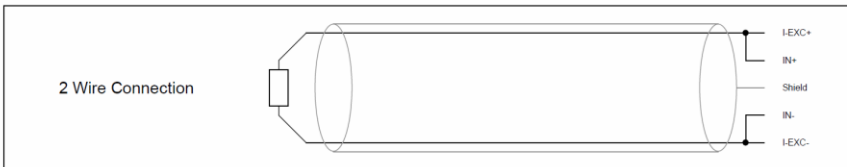
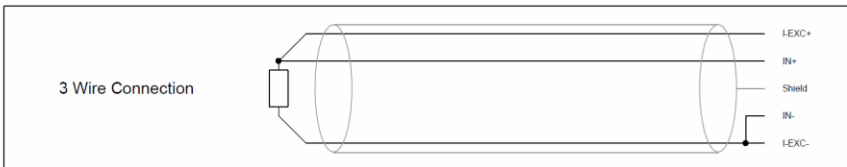
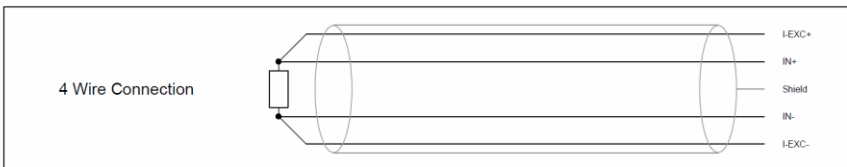
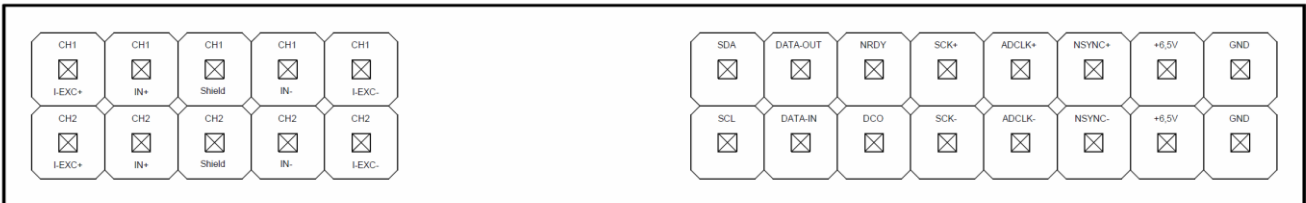
MTP-Pt100/1000 - Acquisition module for 2 channels RTD sensor



RTD connection for 2 channels Status LED ON = Error Powering and digital bus I/O

MTP-Pt100/1000 (RTD)
 Acquisition module for 2 RTD sensors
 Range -100 to 600°C, -50 to 300°C or -25 to 150°C
 Type Pt100 or Pt1000
 Current EXC. 1mA
 Connection: 4-wire, 3-wire and 2 wire
 Sensor break detection
 Signal bandwidth 6Hz
 Resolution 16bit
 Accuracy <0.2%
 Powering: 6.5-9V DC
 Current consumption 60mA
 Vibration: 5g
 Static acceleration: 3000g
 Shock: 10000g

PT100/PT1000 Connection

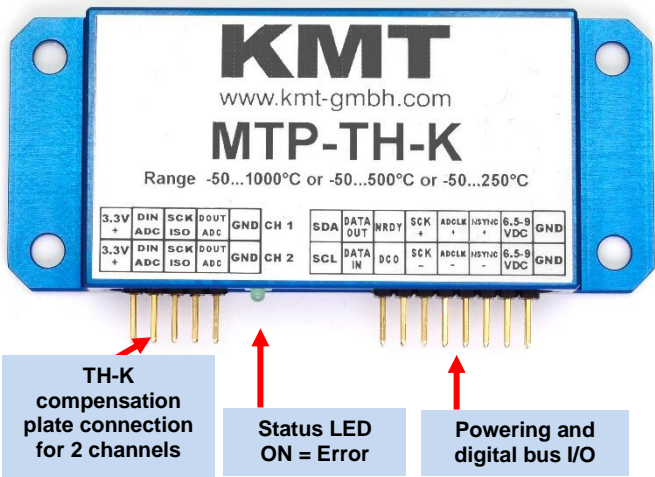


Shield only for noisy environmental or long cables

MTP-Pt100 - Temperature range table

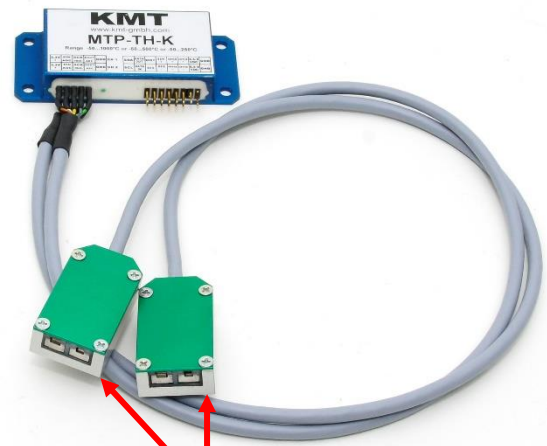
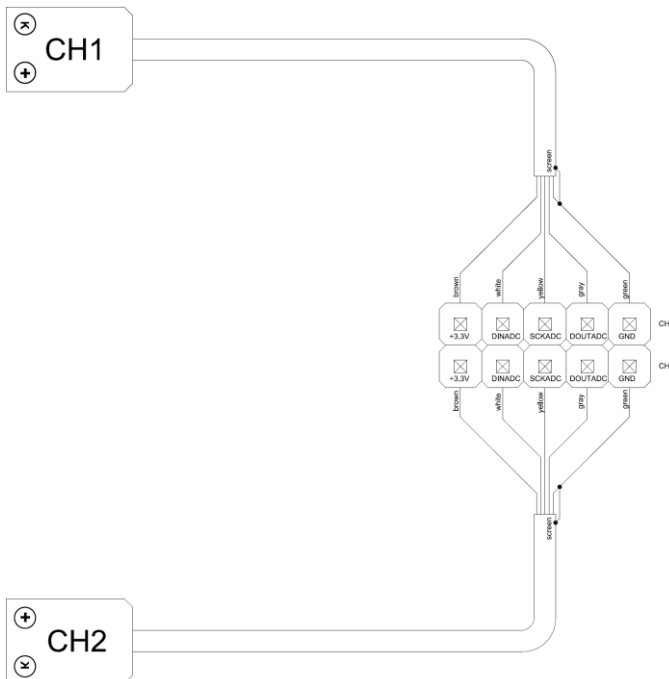
Temperature measuring range Pt100: -100 to 600°C C							
Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]
-50	-0.50	150	1.50	350	3.50	550	5.50
0	0.00	200	2.00	400	4.00	600	6.00
50	0.50	250	2.50	450	4.50		
100	1.00	300	3.00	500	5.00		
Temperature measuring range Pt100: -50 to 300°C or							
Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]
-50	-1.00	50	1.00	150	3.00	250	5.00
0	0.00	100	2.00	200	4.00	300	6.00
Temperature measuring range Pt100: -25 to 150°C							
Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]
-50	-2.00	50	2.00	150	6.00		
0	0.00	100	4.00				

MTP-TH-K - Acquisition module for 2 channels thermo couples



MTP-TH-K
 Acquisition module for 2x TH-K
 Inputs galvanic isolated
 Range -50 to 1000°C, -50 to 500°C or -50 to 250°C
 Cut-off filter 30Hz (standard) more on request
 Resolution 16bit
 Accuracy: 0.2% at 1000°C range
 Powering: 6.5-9V DC
 Current consumption 110mA with cold junction compensation plate
 Vibration: 5g
 Static acceleration: 3000g
 Shock: 10000g

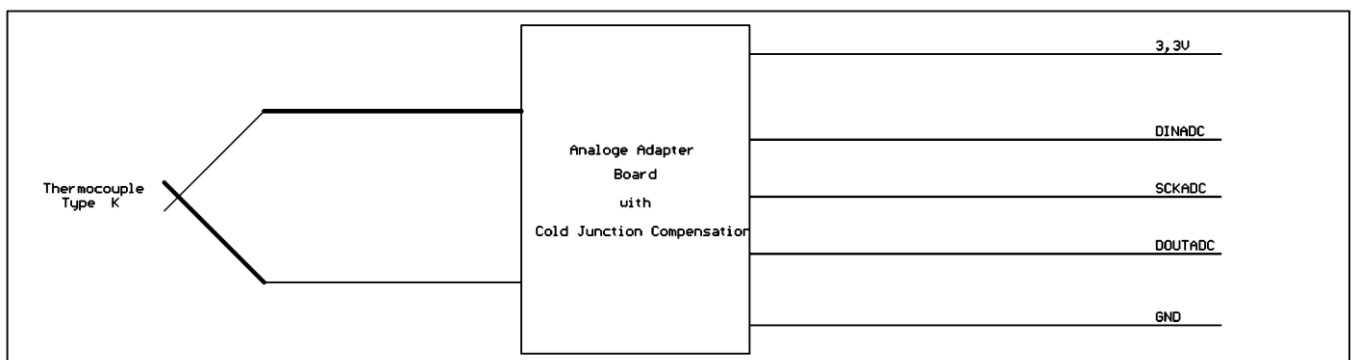
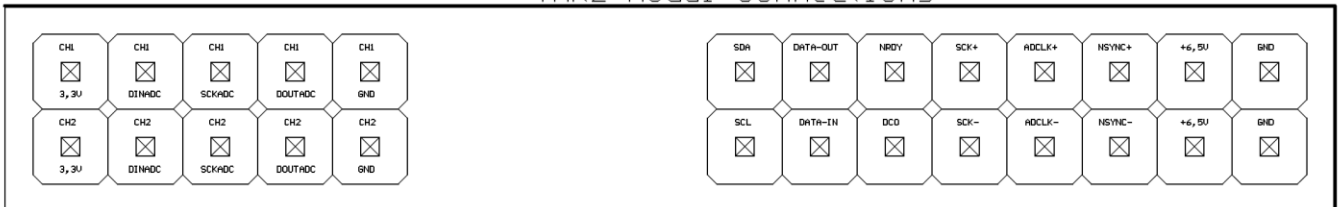
TH-K pin assignment



Cold junction compensation plate integrated in TH-K mini connector!

Caution: Cable length between MTP-TH-K module and compensation plate can be max. 100cm, factory standard length is 20cm! Shield cable, shield must connect on GND!!

THK2 Modul Connections



MTP-TH-K - Temperature range table

Temperature measuring range type K: -50°C to +1000°C

Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]
-50	-0.50	250	2.50	550	5.50	850	8.50
0	0.00	300	3.00	600	6.00	900	9.00
50	0.50	350	3.50	650	6.50	950	9.50
100	1.00	400	4.00	700	7.00	1000	10.00
150	1.50	450	4.50	750	7.50		
200	2.00	500	5.00	800	8.00		

Temperature measuring range type K: -50°C to +500°C

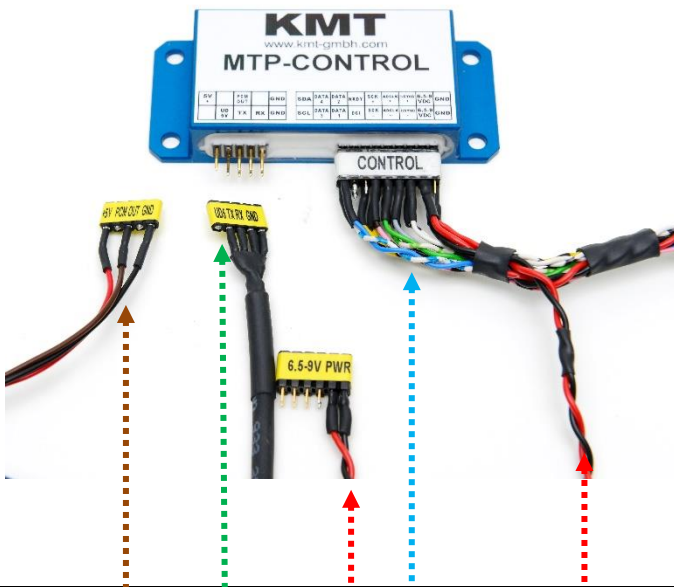
Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]
-50	-1.00	100	2.00	250	5.00	400	8.00
0	0.00	150	3.00	300	6.00	450	9.00
50	1.00	200	4.00	350	7.00	500	10.00

Temperature measuring range type K: -50°C to +250°C

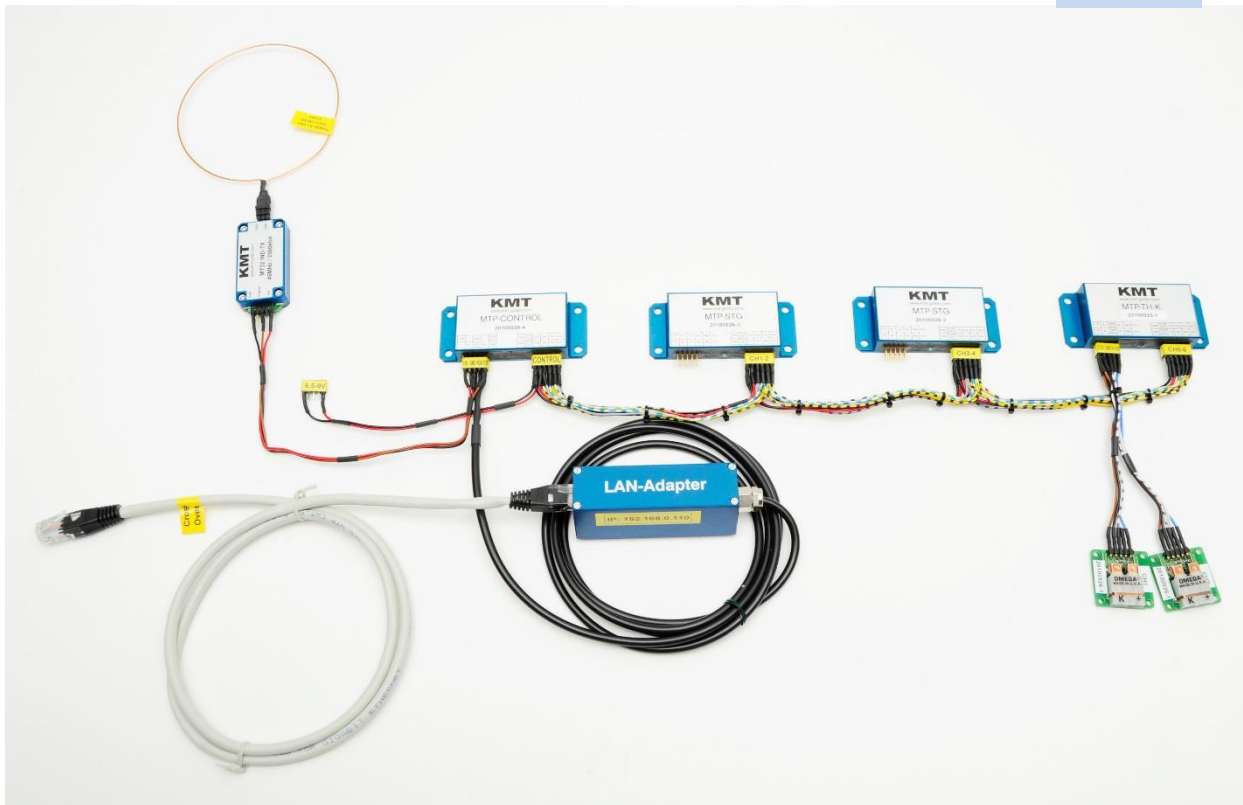
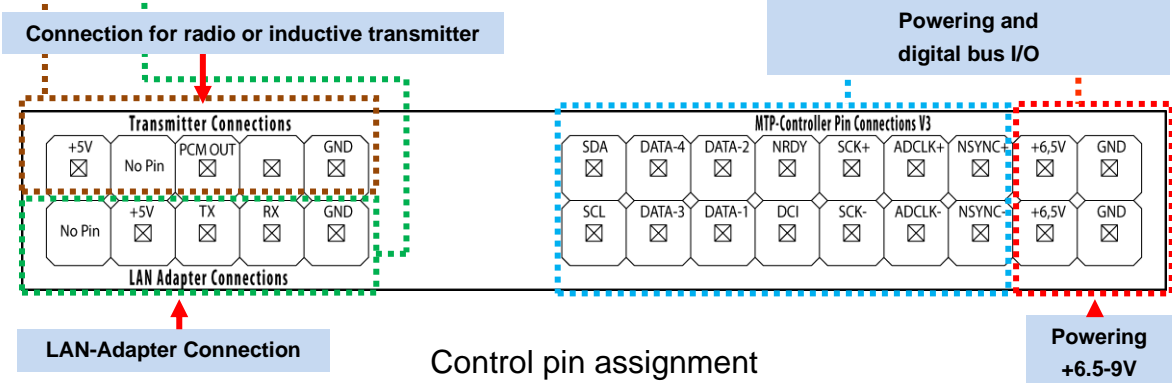
Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]
-50	-2.00	150	6.00				
0	0.00	200	8.00				
50	2.00	250	10.00				
100	4.00						

If no thermocouple is connected or the connection broken, the output is -10V!

MTP-CONTROLLER - Controller for 1- 32 acquisition modules = 64 channels

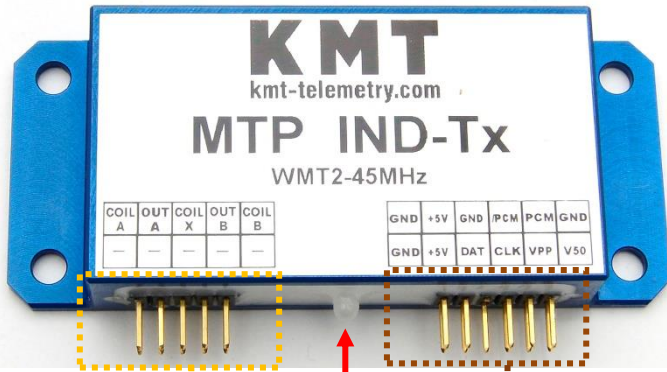


MTP-CONTROL
 Controller for 1- 32 acquisition modules = 64 channels
 Output: PCM
 Programmable via LAN adapter
 Powering: 6.5-9V DC
 Current consumption 40mA (with connected LAN Adapter 80mA)
 Vibration: 5g
 Static acceleration: 3000g
 Shock: 10000g



Example of a MTP system (rotating side) with LAN-Adapter and inductive transmitter incl. demo coil

IND TX - Inductive transmitter

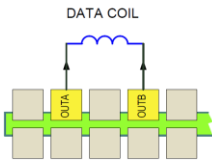


MTP-IND-TX (New version 2016) for MTP

Inductive data transmission transmitter with 45MHz carrier
 Transmission rate 2500kbit/s, **optional 5000kBit/s**
 Distance up to 100mm, typical 50mm (between coil and pickup)
 Consumption of current: 70mA
 Powering: 5V DC (powering comes via MTP-Controller)
 Vibration: 5g
 Static acceleration: 3000g
 Shock: 10000g
 Water protected!

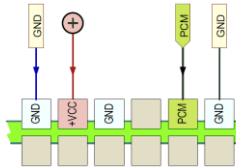
Power ON LED

Data Coil Connection
 standard connection



Typical connection transmitting coil

PCM Data Input (asymmetrical)
 standard connection



Typical connection Power and data



MTP-Control with MTP IND-Tx

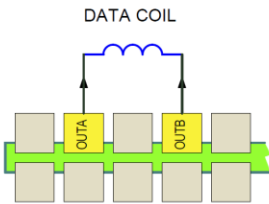


MT32-IND-TX (Version until 2015) for MTP

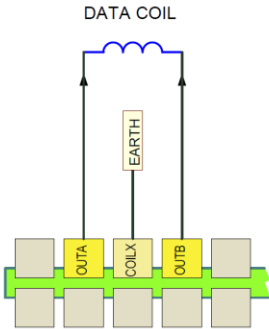
Inductive data transmission transmitter with 45MHz carrier
 Transmission rate 2500kbit/s
 Distance up to 100mm, typical 50mm (between coil and pickup)
 Consumption of current: 70mA
 Powering: 5V DC (powering comes via MTP-Controller)
 Vibration: 5g
 Static acceleration: 3000g
 Shock: 10000g
 Water **non-protected**

WMT2 Connection Overview

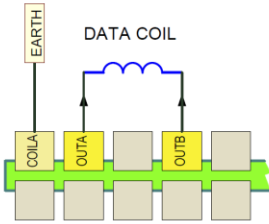
Data Coil Connection
standard connection



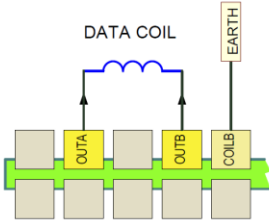
EARTH Connection (symmetrical)
for special cases only



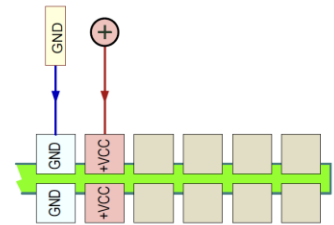
EARTH Connection (asymmetrical A)
for special cases only



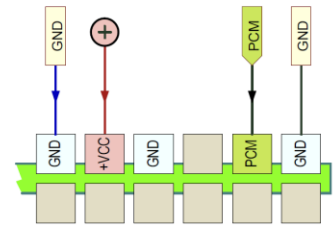
EARTH Connection (asymmetrical B)
for special cases only



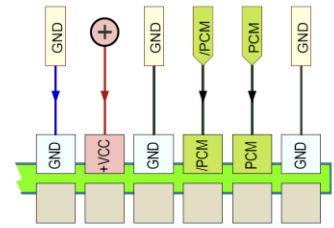
VCC Power Input (4.9 - 5.1 Vdc)
standard connection



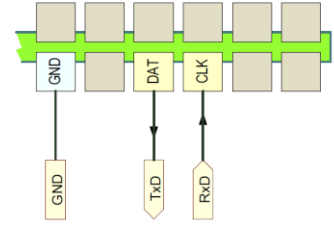
PCM Data Input (asymmetrical)
standard connection



PCM Data Input (symmetrical)
reserved for future use

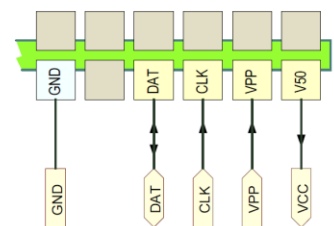


Communication (to/from controller)
reserved for future use

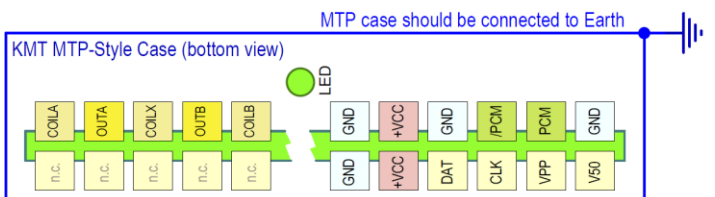
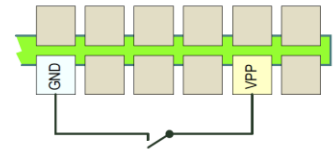


RS232 = TTL Level

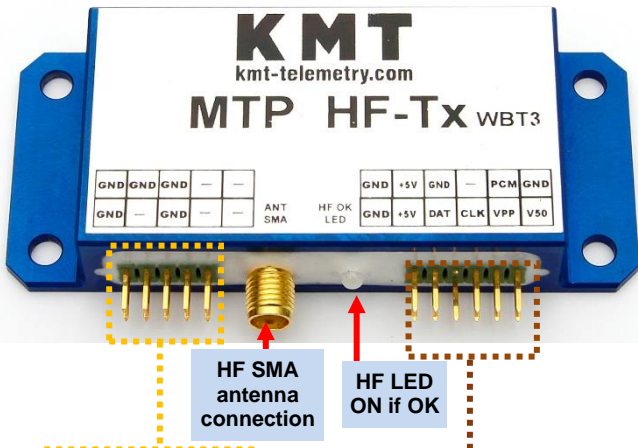
Firmware Update (PIC programmer)
for KMT factory use



Standby Switch (switch or NPN)
reserved for future use



HF-TX - Radio transmitter



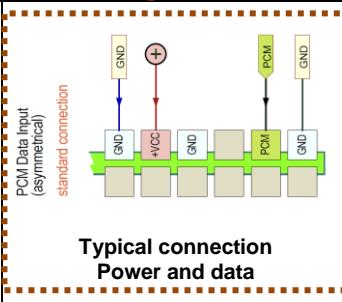
MTP-HF-TX (New version 2016) for MTP

Radio data transmission transmitter
 Transmission rate 312.5, 625, 1250, 2500 and 5000kbit/s,
 Distance up to 1m (between wire antenna and receiving antenna)
 Consumption of current: 100mA
 Powering: 5V DC (powering comes via MTP-Controller)
 Vibration: 5g
 Static acceleration: 3000g
 Shock: 10000g
 Water protected, but not connectors!

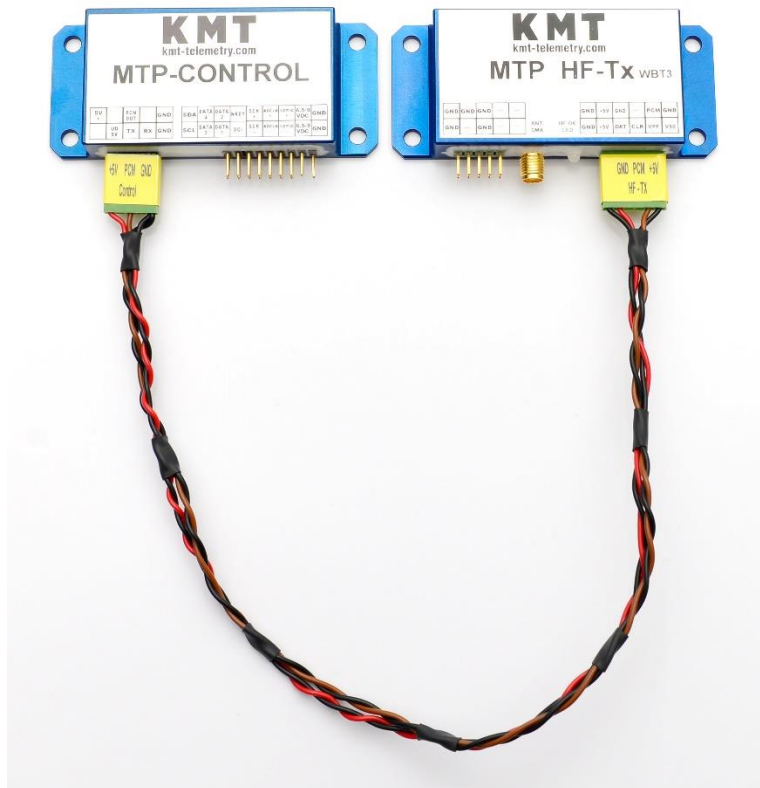
HF SMA antenna connection

HF LED ON if OK

Pins are for KMT internal use only!



Wire antenna for shaft application with SMA connector



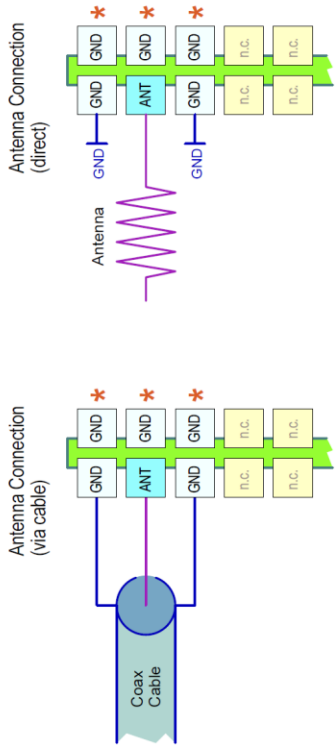
MTP-Control with MTP HF-Tx



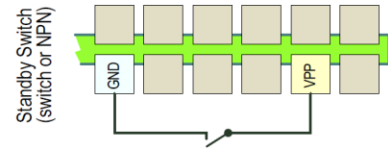
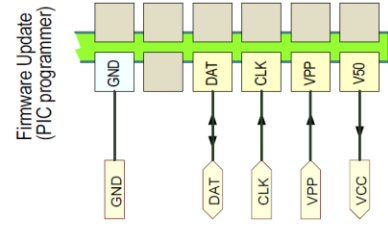
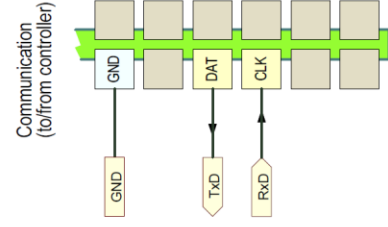
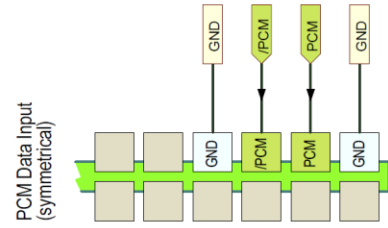
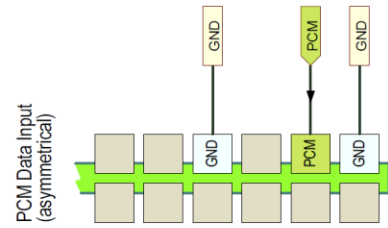
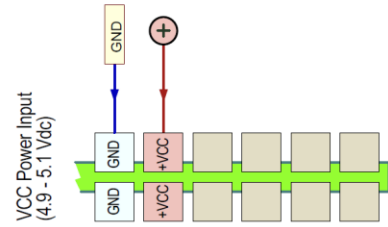
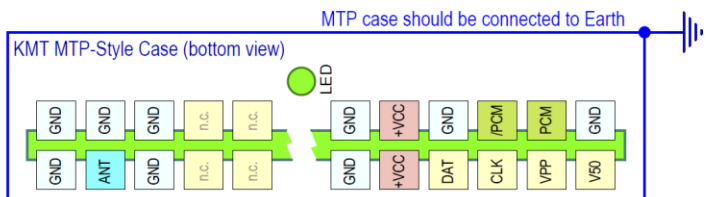
MT32-HF-TX (Version until 2015) for MTP

Radio data transmission transmitter
 Transmission rate 312.5, 625, 1250, 2500 and 5000kbit/s,
 Distance up to 1m (between wire antenna and receiving antenna)
 Consumption of current: 100mA
 Powering: 5V DC (powering comes via MTP-Controller)
 Vibration: 5g
 Static acceleration: 3000g
 Shock: 10000g
 Water **non-protected**

WBT3 Connection Overview



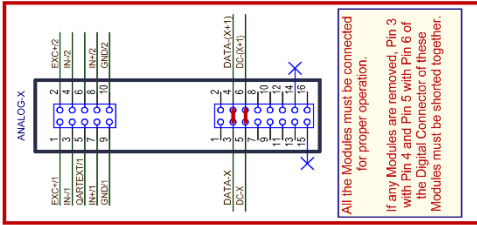
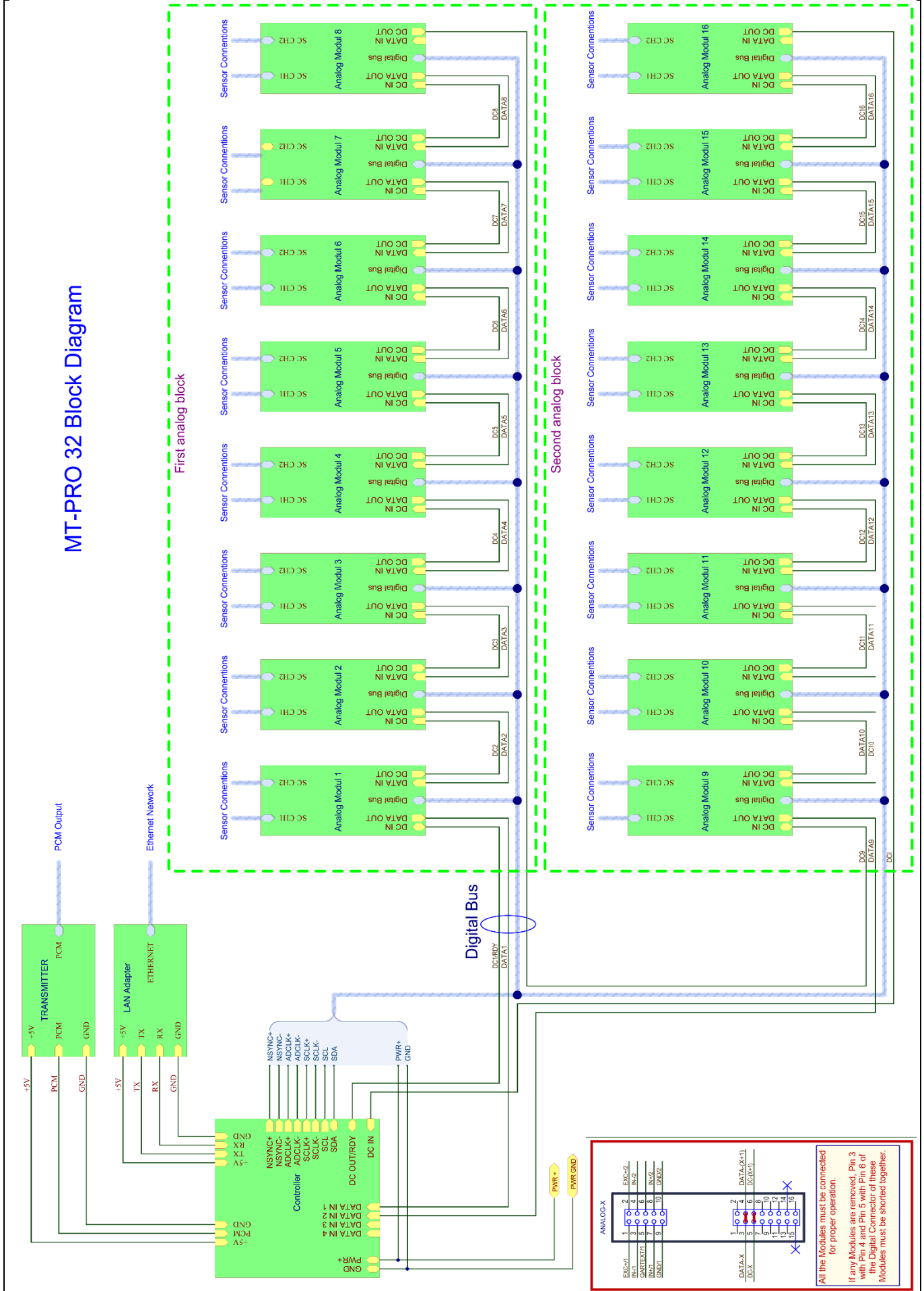
* Do not connect this pins, if compatibility to inductive transmitter WMT2 is necessary!



RS232 = TTL Level

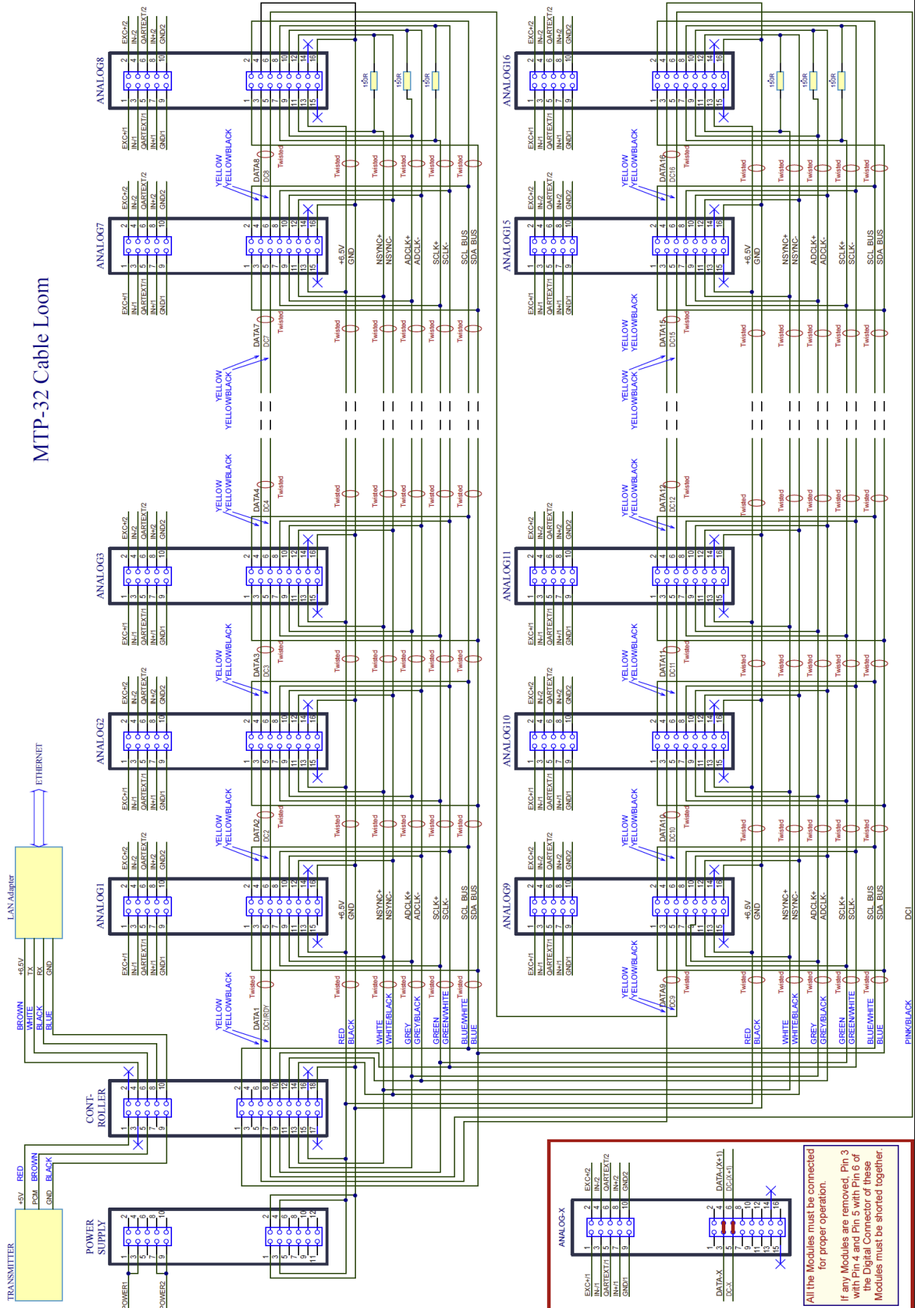
MTP - Block diagram example for 32 channels

MT-PRO 32 Block Diagram



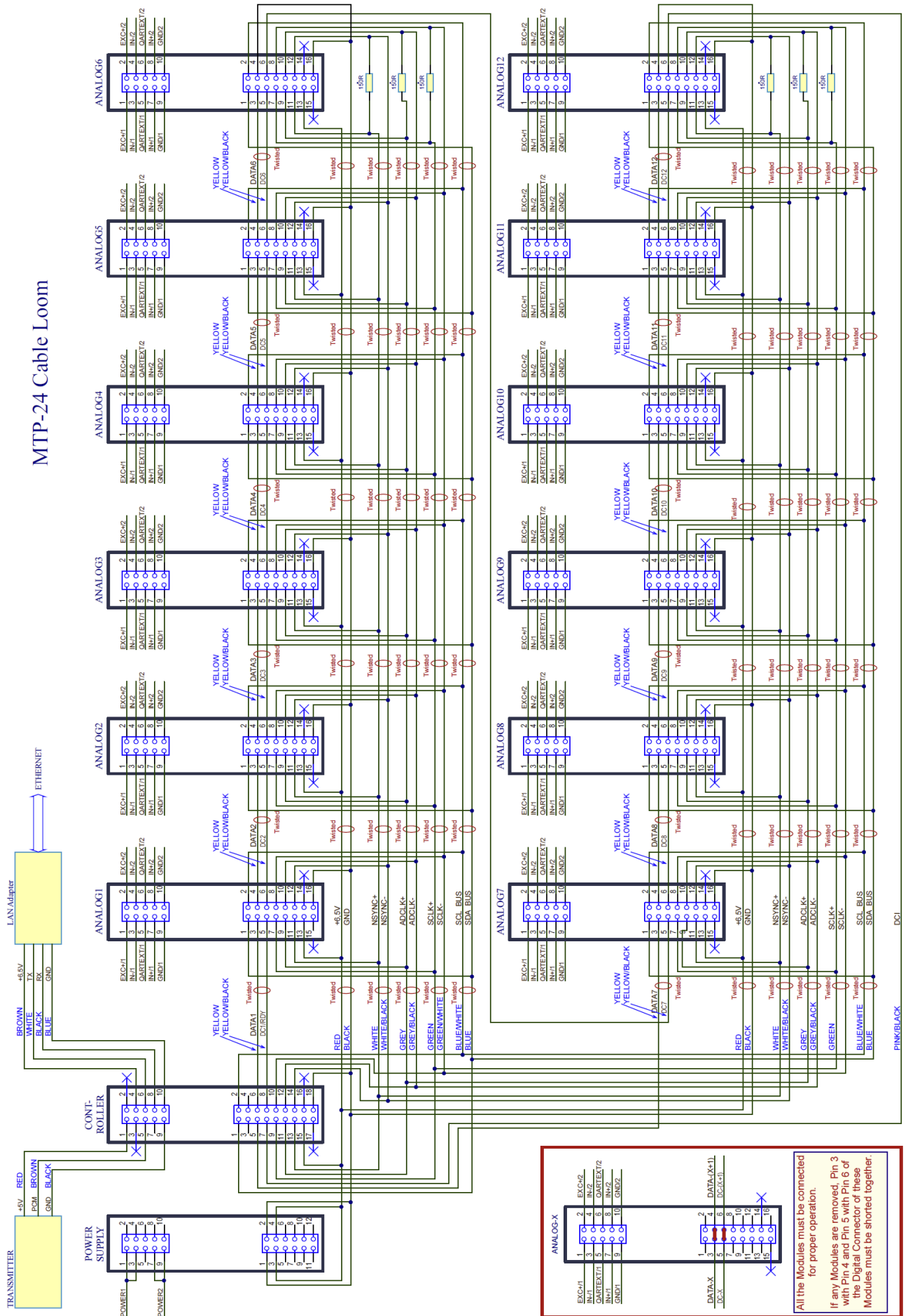
MTP – 32 CH cable loom and connection

MTP-32 Cable Loom



Take care with your pin connection if you solder the cable! - Don't plug any modules if Power is ON!!! First power OFF!!!

MTP-24 Cable Loom

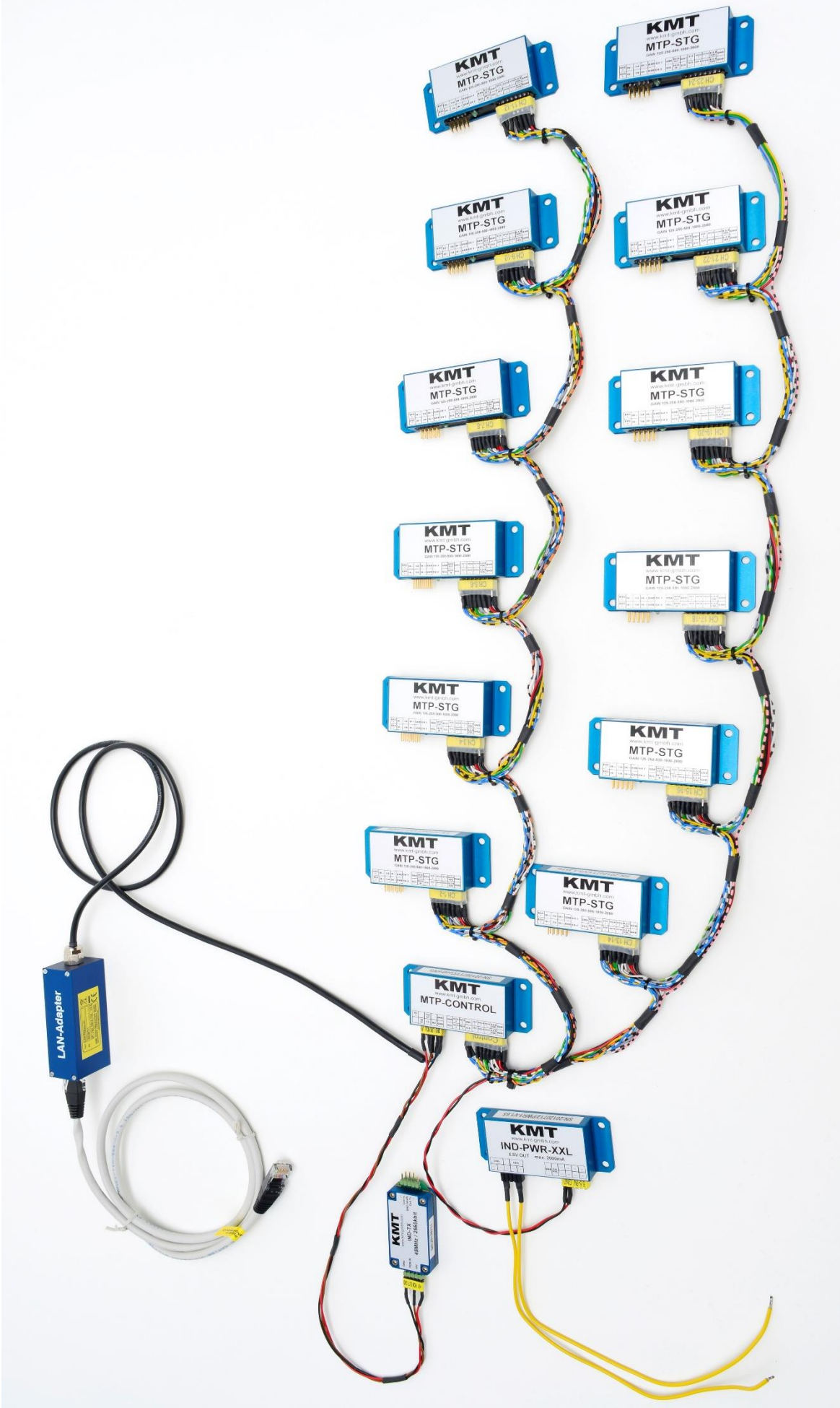


ANALOG-X

1	EXC+1
2	IN+1
3	QARTEXT1
4	IN+2
5	EXC+2
6	IN+2
7	QARTEXT2
8	IN+1
9	IN+2
10	GND1
11	DATA-X
12	DC1-X
13	DC2-X
14	DC3-X
15	DC4-X
16	DC5-X
17	DC1-X
18	DC2-X
19	DC1-X
20	DC2-X
21	DC1-X
22	DC2-X
23	DC1-X
24	DC2-X

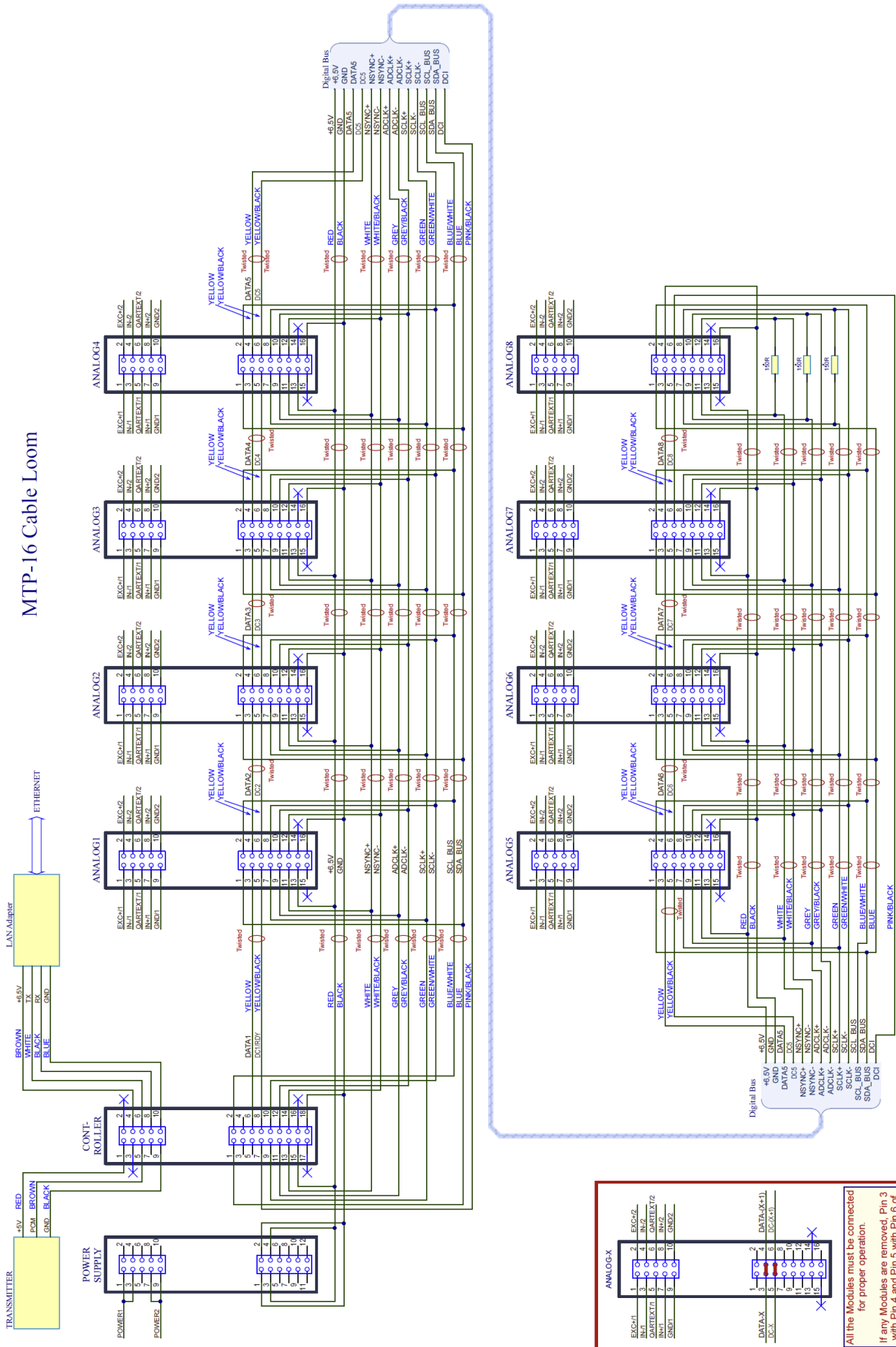
All the Modules must be connected for proper operation.
If any Modules are removed, Pin 3 with Pin 4 and Pin 5 with Pin 6 of the Digital Connector of these Modules must be shorted together.

Take care with your pin connection if you solder the cable! - Don't plug any modules if Power is ON!!! First power OFF!!!



MTP – 16 CH cable loom and connection

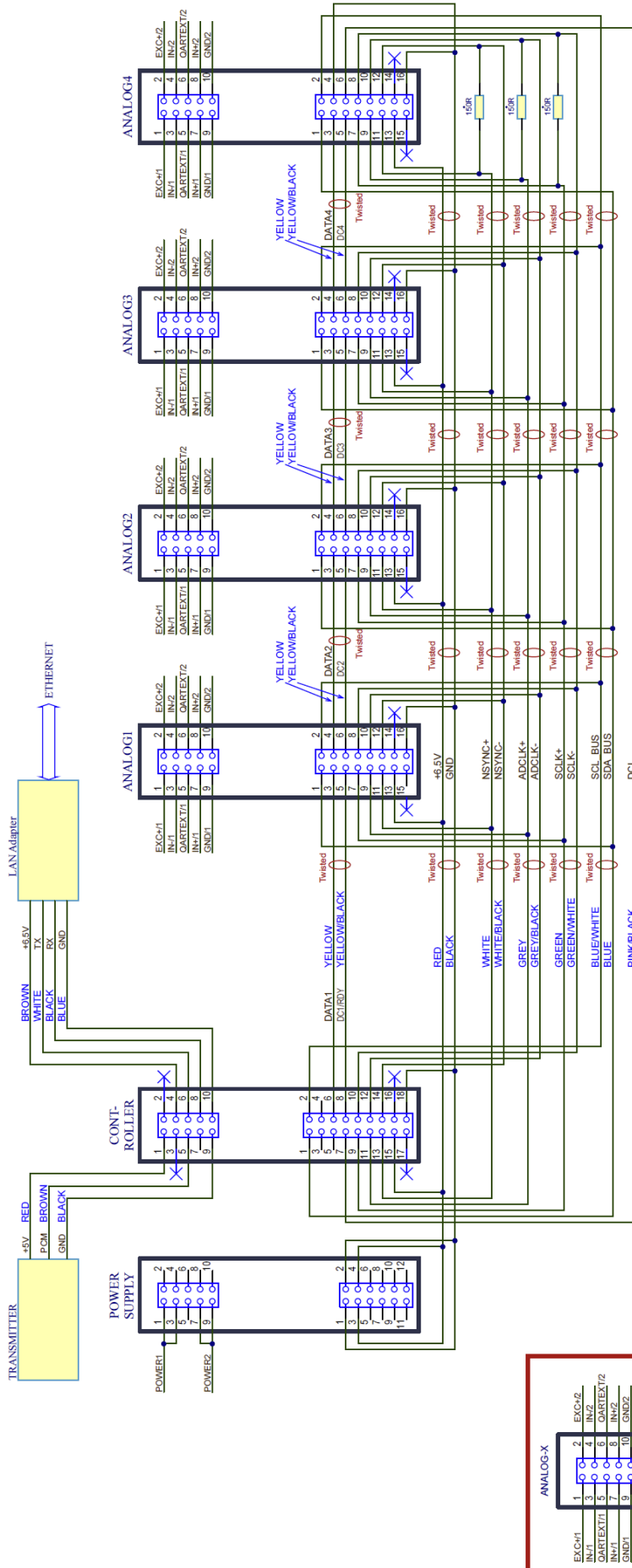
MTP-16 Cable Loom



Take care with your pin connection if you solder the cable! - Don't plug any modules if Power is ON!!! First power OFF!!!

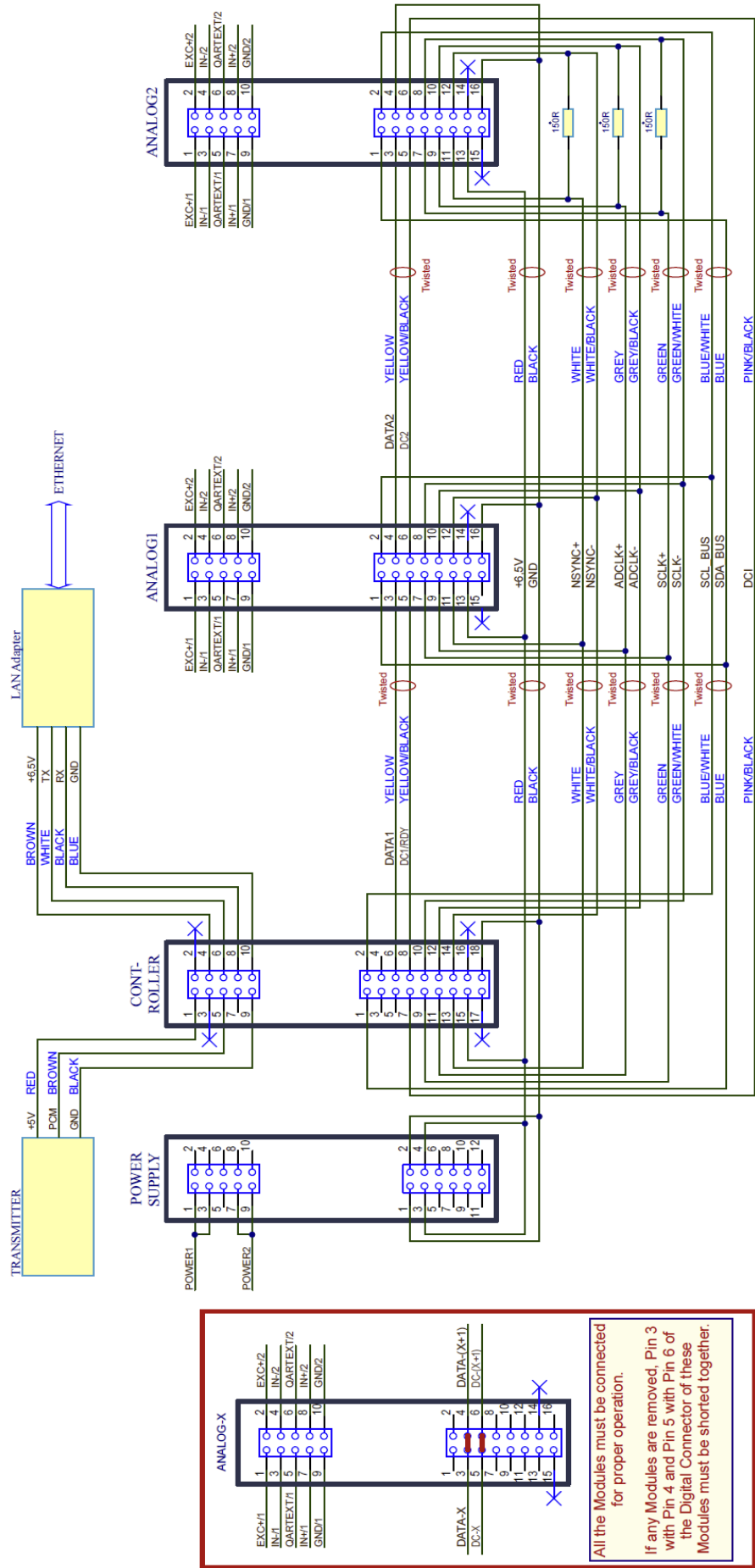


MTP-8 Cable Loom



Take care with your pin connection if you solder the cable! - Don't plug any modules if Power is ON!!! First power OFF!!!

MTP-4 Cable Loom



All the Modules must be connected for proper operation.
 If any Modules are removed, Pin 3 with Pin 4 and Pin 5 with Pin 6 of the Digital Connector of these Modules must be shorted together.

Take care with your pin connection if you solder the cable! - Don't plug any modules if Power is ON!!! First power OFF!!

MTP- Explanation of abbreviations of block diagram

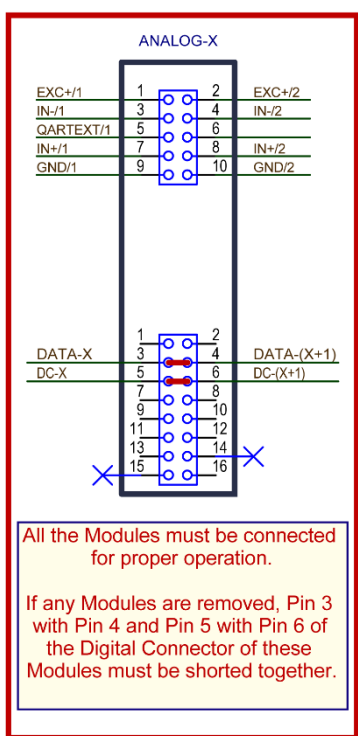
NSYNC+ :	ADC synchronizing signal+
NSYNC- :	ADC synchronizing signal-
ADCLK+ :	ADC clock signal+
ADCLK- :	ADC clock signal-
SCLK+ :	ADC data shift out clock signal+
SCLK- :	ADC data shift out clock signal-
SCL :	IIC clock signal for setting up analog channel parameter
SDA :	IIC data signal for setting up analog channel parameter
DC OUT/RDY :	daisy chain signal out from controller while setting up analog channels / ready signal from the ADC while measuring
DC2 .. DC16 :	daisy chain signal from one module to the next module
DC I :	daisy chain signal to the controller from the end of the module chain
DATA 2 .. DATA 8 :	data daisy chain signals of the first analog block
DATA 10 .. DATA 16:	data daisy chain signals of the second analog block
DATA 1 :	data in from the first analog block
DATA 9 :	data In from the second analog block
PCM :	PCM output signal
TX :	RS232 transmit signal to the LAN adapter
RX :	RS232 receive signal from the LAN adapter
+5V :	+5V power for the LAN Adapter and the transmitter
GND :	power ground for the LAN Adapter and the transmitter
PWR + :	power supply + 6-9V
PWR GND :	power supply ground

Important:

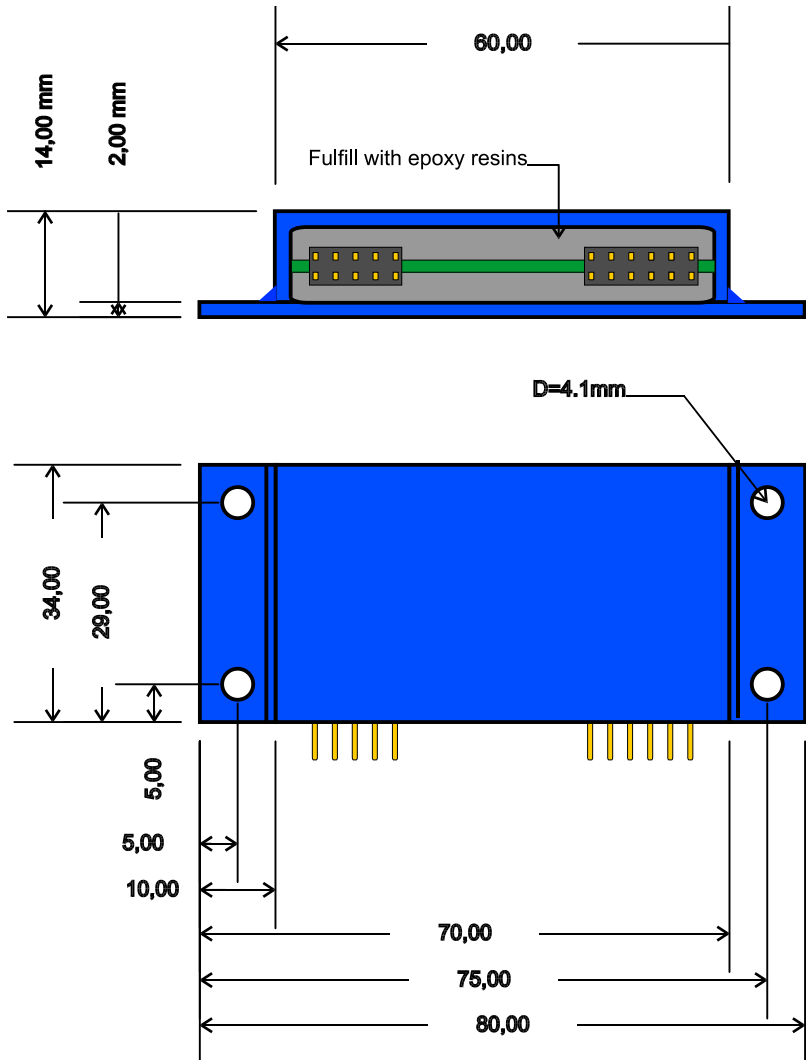
In one analog block maximal 8 analog modules can be daisy chained.

The daisy chain loops must not be broken! If one of the modules is missing, the signals of this position must be shorted together:

"DATA OUT" <-> "DATA IN" and "DC OUT" <-> "DC IN"



MTP acquisition module - dimensions

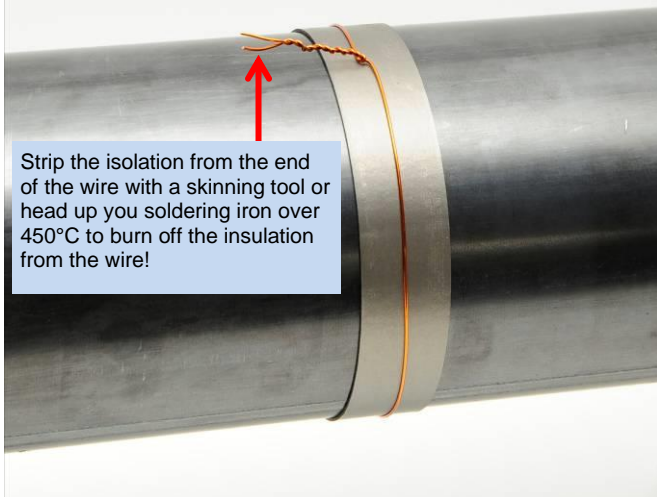


Weight about 60 grams

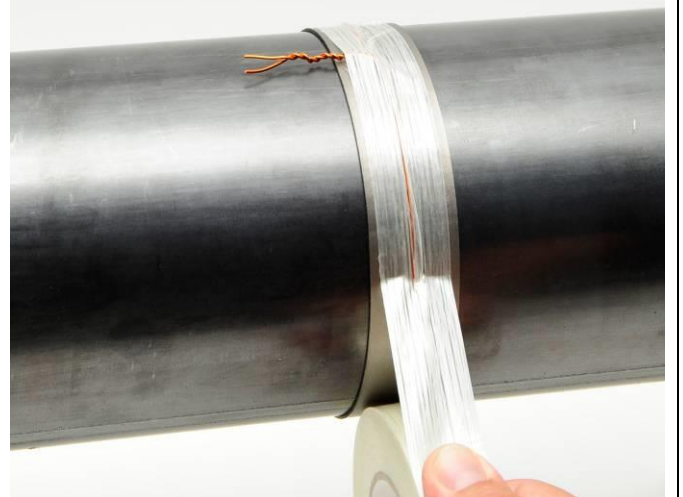
Inductive transmission (2500kbit) with MTP-IND-TX-RX with 45MHz carrier!
With 45MHz carrier is only 1x winding necessary!



Attach for electromagnetic insulation "Ferrite Tape" 2 x one layer around the shaft.



Strip the isolation from the end of the wire with a skinning tool or head up you soldering iron over 450°C to burn off the insulation from the wire!



Make transmitting coil with 1x winding and twisted the end of wire. Use CUL 0.63-1.00mm wire (CUL = Enamelled copper wire)

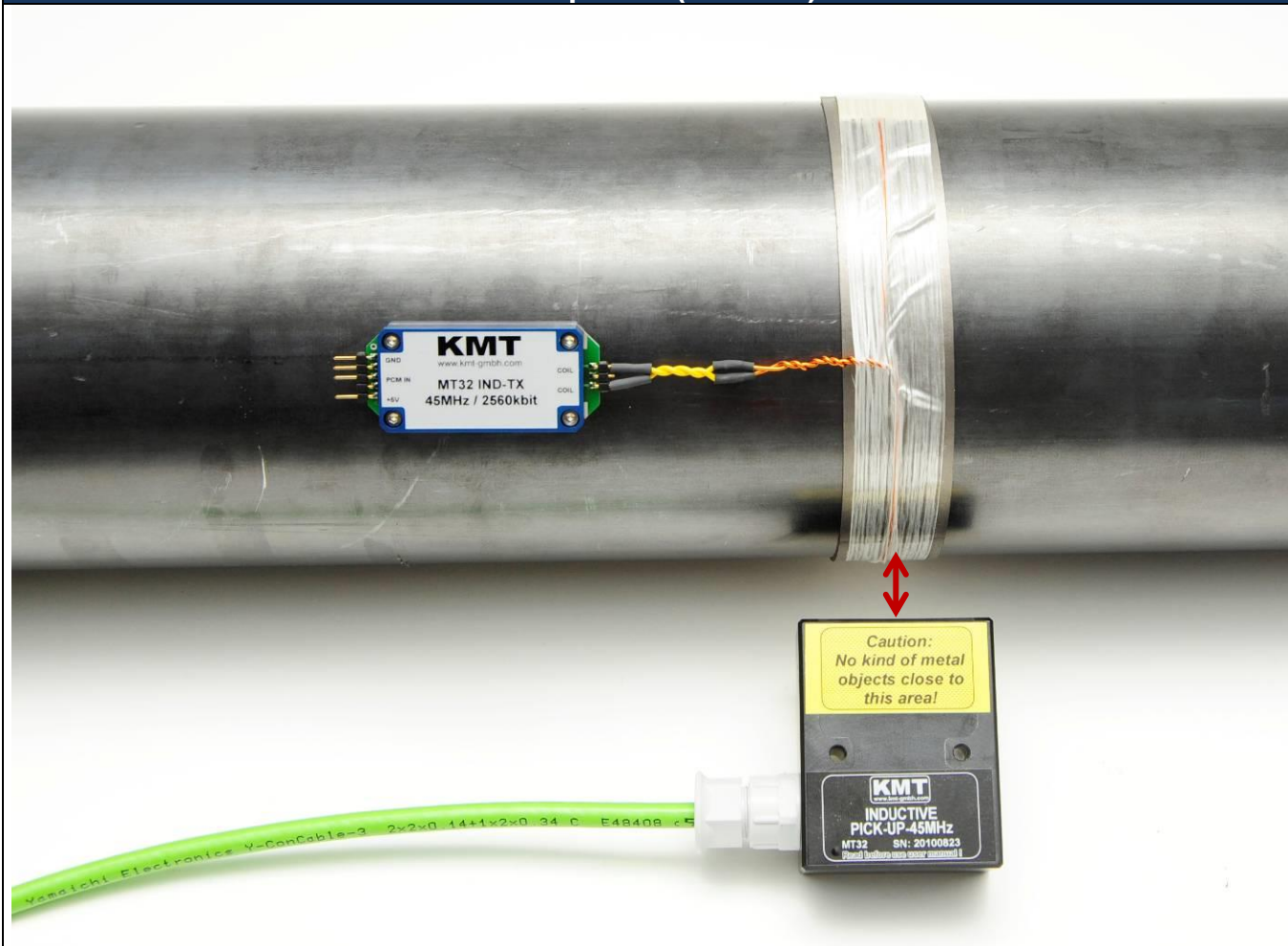
Fixed it with 3 layers mounting tape



Extend the CUL wire flexible 0.14-0.25mm wire (to decouple the inflexible 1mm wire!, at 0.63 not necessary)

Twisted also the flexible wire and solder it on the MTP-IND-Tx (isolate all solder points with shrink tubing)

MTP-IND-TX-RX with 45MHz carrier!
Pickup head (2500kbit)



Inductive Pick-Up head mount in this position! Distance between head and Tx coil can be up to 100mm
Typical 50mm, distance deepens of application!!

To avoid transmitting problems, the transmitter module must be close the transmitting antenna!
The cables (PCM/GND/+5V) between MPT-IND-TX 45MHz and MTP-CONTROL can be 1000mm long!

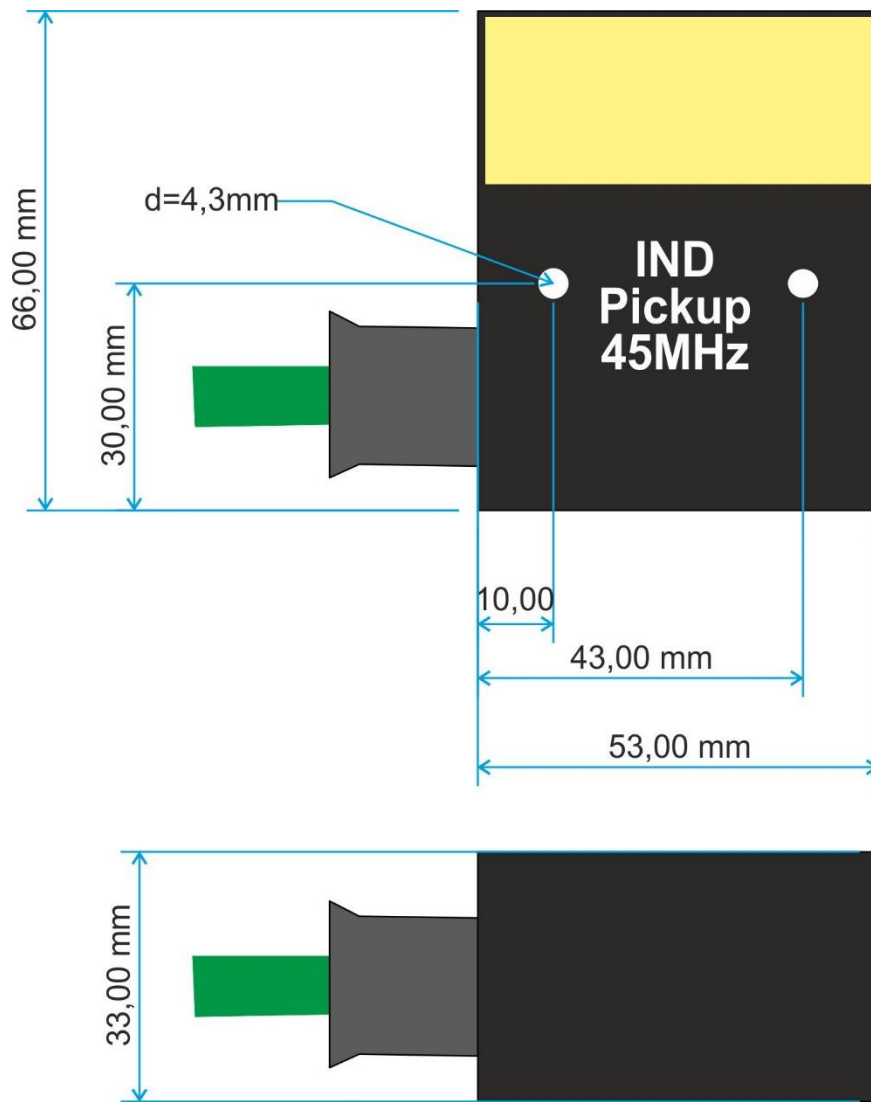
CAUTION:

If you want to install also an inductive power coil close to the data coil, the minimal distance must be <10mm!
(distance between IND-PWR coil to IND-DATA coil)

Picture of IND-PICKUP-HEAD 45MHz



Dimensions of IND-PICKUP-HEAD 45MHz

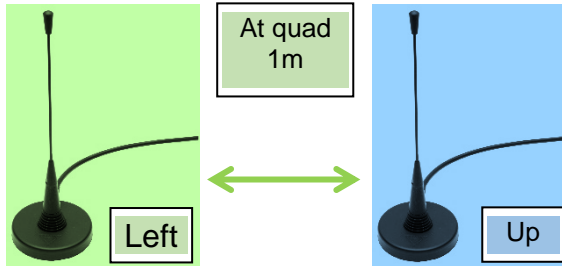


MTP 312.5 - 5000k Installation of the radio transmitter on a shaft
For rotating application we normal recommend an inductive transmission instead of radio transmission!



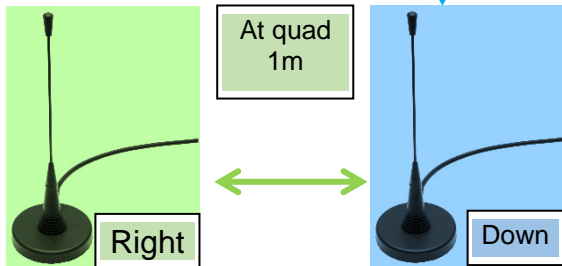
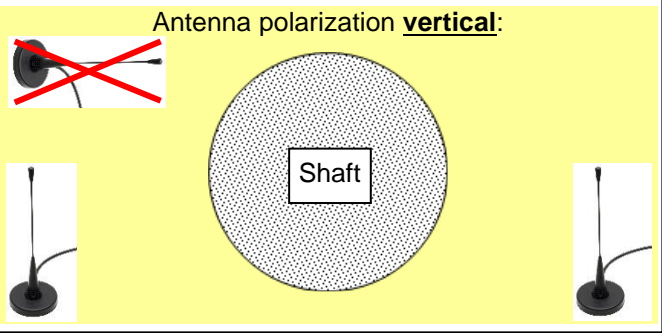
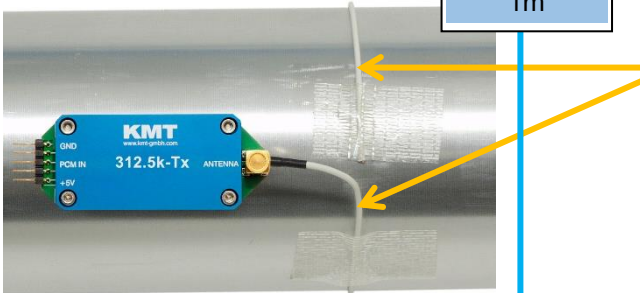
Cable Red = +5V
 Cable Black = GND (Ground)
 Cable Brown = PCM In
 Cable White = Wire antenna

All cable connections should be soldered.

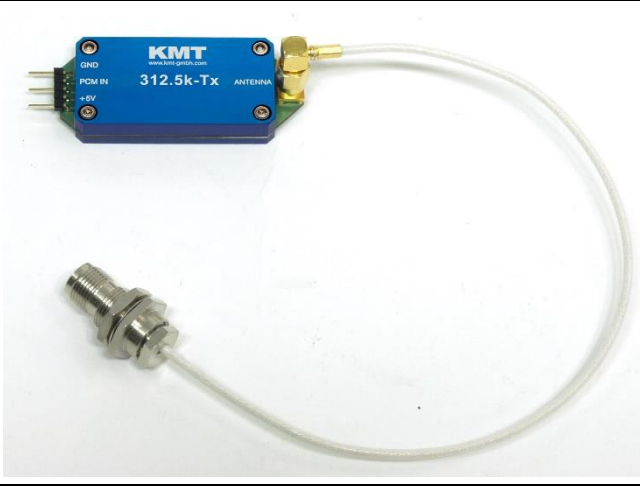


Installation of diversity antennas (2x):
 Install about 1m far from shaft,
 1x up and 1x down side

Mount the cable antenna exactly one winding around the shaft and fix all with 3 windings mounting tape – finish!
 The cable antenna can extend or shorten depending upon requires! (Isolate the solder connection, if you extend the wire antenna cable!)



Installation of quad antennas (4x):
 Install about 1m far from shaft,
 1x up and 1x down side and
 1x left and 1x right side
 About 1m distance to each other antenna

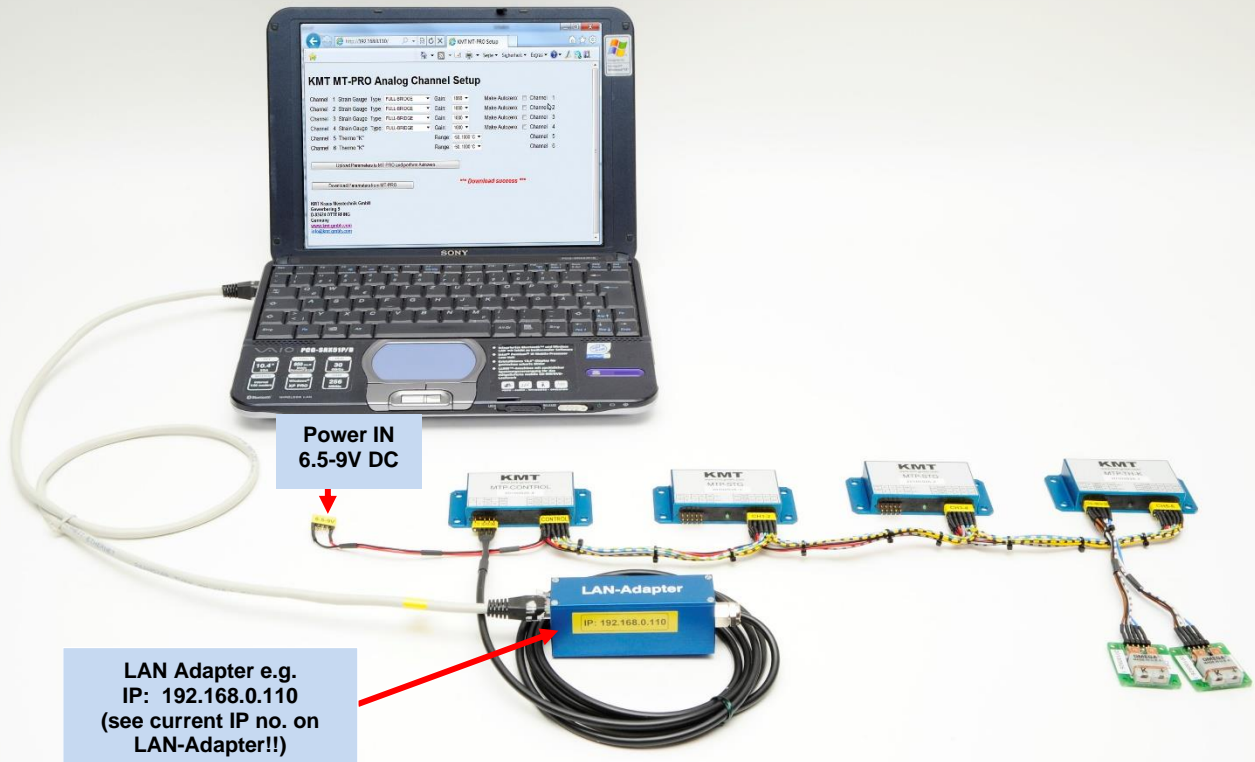



This coaxial adapter (**Tx-TNC-adapter**) makes it possible to connect an antenna with TNC connector for point to point applications. (option)

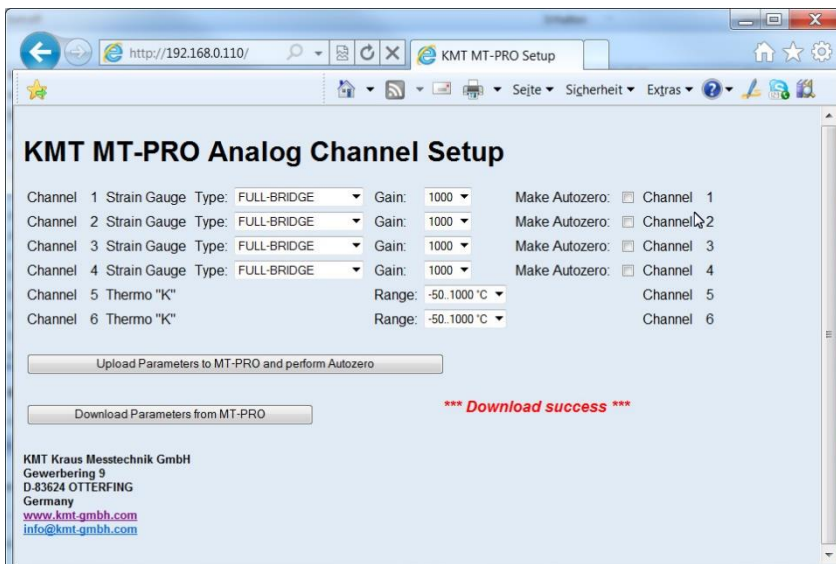


Transmitting antenna 0dB with magnetic foot (option)

MTP Software setup via LAN-Adapter and notebook



- 1) Power the MTP modules with power 6.5-9VDC
- 2) Connect the LAN-Adapter with the MTP-CONTROL module (see pin connection at MTP-CONTROL)
- 3) Adjust your notebook to manual on e.g. IP 192.168.0.100
- 4) Connect LAN-Adapter with your notebook via cross-over LAN cable
- 5) Open  Microsoft Internet Browser and enter IP address **192.168.0.110** (see current IP no. of LAN-Adapter!!)
- 6) Now you get access on the web-interface and can adjust the MTP-CONTROL module



MTP-CONTROL V3 - Software setup

DOWNLOAD parameters for device

Channel 1 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 1

Channel 2 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 2

Channel 3 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 3

Channel 4 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 4

Channel 5 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 5

Channel 6 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 6

Channel 7 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 7

Channel 8 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 8

Channel 9 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 9

Channel 10 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 10

Channel 11 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 11

Channel 12 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 12

Channel 13 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 13

Channel 14 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 14

Channel 15 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 15

Channel 16 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 16

Channel 17 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 17

Channel 18 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 18

Channel 19 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 19

Channel 20 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 20

Channel 21 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 21

Channel 22 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 22

Channel 23 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 23

Channel 24 Strain Gauge Type: FULL-BRIDGE Gain: 1000 Make Autozero: Manual Offset: 0 Channel 24


Upload Parameters to MT-PRO and perform Autozero

Download Parameters from MT-PRO ***** Download success *****

Switch on Test-Shunt Resistors for 20 sec.

KMT Kraus Messtechnik GmbH
Gewerbering 9
D-83624 OTTERFING
Germany
www.kmt-gmbh.com
info@kmt-gmbh.com

First you can download the stored parameters from the acquisition modules via LAN adapter from the controller module .
All connected acquisition modules will detect!

Caution:
Never use the refresh button  on your browser; otherwise the parameters of you browser cash will upload to the MTP-STG!°

KMT MT-PRO Analog Channel Setup

Channel 1	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 1
Channel 2	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 2
Channel 3	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 3
Channel 4	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 4
Channel 5	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 5
Channel 6	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 6
Channel 7	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 7
Channel 8	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 8
Channel 9	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 9
Channel 10	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 10
Channel 11	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 11
Channel 12	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 12
Channel 13	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 13
Channel 14	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 14
Channel 15	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 15
Channel 16	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 16
Channel 17	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 17
Channel 18	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 18
Channel 19	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 19
Channel 20	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 20
Channel 21	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 21
Channel 22	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 22
Channel 23	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 23
Channel 24	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 24

Upload Parameters to MT-PRO and perform Autozero

Download Parameters from MT-PRO

*** Download success ***

Switch on Test-Shunt Resistors for 20 sec.

KMT Kraus Messtechnik GmbH
 Gewerberg 9
 D-83624 OTTERFING
 Germany
www.kmt-gmbh.com
info@kmt-gmbh.com

Select full-, half- or quarter-bridge by popup window

Execute through "Upload Parameters to MT-PRO and perform Autozero" button

If you want test your bridge, you can execute the function "Test-Shunt Resistor for 20 sec." button

In this case all STG channels get a shunt-cal step of about 80% of the from measuring range at GAIN 2000
 In this case all STG channels get a shunt-cal step of about 40% of the from measuring range at GAIN 1000
 In this case all STG channels get a shunt-cal step of about 20% of the from measuring range at GAIN 500
 In this case all STG channels get a shunt-cal step of about 10% of the from measuring range at GAIN 250
 In this case all STG channels get a shunt-cal step of about 5% of the from measuring range at GAIN 125

KMT MT-PRO Analog Channel Setup

Channel	Type	Type	Gain	Make Autozero	Manual Offset	Channel
Channel 1	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 1
Channel 2	Strain Gauge	Type: FULL-BRIDGE	Gain: 2000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 2
Channel 3	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 3
Channel 4	Strain Gauge	Type: FULL-BRIDGE	Gain: 500	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 4
Channel 5	Strain Gauge	Type: FULL-BRIDGE	Gain: 250	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 5
Channel 6	Strain Gauge	Type: FULL-BRIDGE	Gain: 125	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 6
Channel 7	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 7
Channel 8	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 8
Channel 9	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 9
Channel 10	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 10
Channel 11	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 11
Channel 12	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 12
Channel 13	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 13
Channel 14	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 14
Channel 15	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 15
Channel 16	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 16
Channel 17	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 17
Channel 18	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 18
Channel 19	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 19
Channel 20	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 20
Channel 21	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 21
Channel 22	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 22
Channel 23	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 23
Channel 24	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 24

Upload Parameters to MT-PRO and perform Autozero

Download Parameters from MT-PRO

*** Download success ***

Switch on Test-Shunt Resistors for 20 sec.

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info@kmt-gmbh.com

Select gain of 125-250-500-1000 or 2000 by popup window
After change the gain you must make a new autozero!!

Execute through "Upload Parameters to MT-PRO and perform Autozero" button

KMT MT-PRO Analog Channel Setup

Channel 1	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input checked="" type="checkbox"/>	Manual Offset: 0	Channel 1
Channel 2	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input checked="" type="checkbox"/>	Manual Offset: 0	Channel 2
Channel 3	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 3
Channel 4	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 4
Channel 5	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input checked="" type="checkbox"/>	Manual Offset: 0	Channel 5
Channel 6	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 6
Channel 7	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 7
Channel 8	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 8
Channel 9	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 9
Channel 10	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 10
Channel 11	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 11
Channel 12	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 12
Channel 13	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 13
Channel 14	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 14
Channel 15	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 15
Channel 16	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 16
Channel 17	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 17
Channel 18	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 18
Channel 19	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 19
Channel 20	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 20
Channel 21	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 21
Channel 22	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 22
Channel 23	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 23
Channel 24	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 24

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info@kmt-gmbh.com

Select Auto-Zero per channel. The Auto-Zero function will be executed only one time per upload the parameters to MTP-STG! It will be stored also after power off in the MTP-STG until you make a new Auto-Zero on this channel!

Execute through **“Upload Parameters to MT-PRO and perform Autozero”** button

KMT MT-PRO Analog Channel Setup

Channel 1	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input checked="" type="checkbox"/>	Manual Offset: 1234	Channel 1
Channel 2	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input checked="" type="checkbox"/>	Manual Offset: -359	Channel 2
Channel 3	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 3
Channel 4	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 4
Channel 5	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input checked="" type="checkbox"/>	Manual Offset: 0	Channel 5
Channel 6	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 6
Channel 7	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 7
Channel 8	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 8
Channel 9	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 9
Channel 10	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 10
Channel 11	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 11
Channel 12	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 12
Channel 13	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 13
Channel 14	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 14
Channel 15	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 15
Channel 16	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 16
Channel 17	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 17
Channel 18	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 18
Channel 19	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 19
Channel 20	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 20
Channel 21	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 21
Channel 22	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 22
Channel 23	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 23
Channel 24	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: <input type="checkbox"/>	Manual Offset: 0	Channel 24

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 Germany
www.kmt-gmbh.com
info@kmt-gmbh.com

After AutoZero you can shift (if necessary) the offset in +/-2000 steps

Execute through **“Upload Parameters to MT-PRO and perform Autozero”** button

Konformitätserklärung

Declaration of Conformity
Declaration de Conformité

Wir
We
Nous

KMT - Kraus Messtechnik GmbH

Anschrift
Address
Adress

Gewerbering 9, D-83624 Otterfing, Germany

erklären in alleiniger Verantwortung, daß das Produkt
declare under our sole responsibility, that the product
declarons sous notre seule responsabilité, que le produit

Bezeichnung
Name
Nom

Messdatenübertragungssystem

Typ,Modell,Artikel-Nr., Größe
Type,Model, Article No.,Taille
Type, Modèle, Mo.d'Article,Taille

MTP Modular Telemetry Pro

mit den Anforderungen der Normen und Richtlinien
fulfills the requirements of the standard and regulations of the Directive
satisfait aux exigences des normes et directives

108/2004/EG

Elektromagnetische Verträglichkeit EMV / EMC

DIN EN 61000-6-3 Ausgabe 2002-8 Elektromagnetische Verträglichkeit
EMV Teil 6-3 Fachgrundnorm Störaussendung

DIN EN 61000-6-1 Ausgabe 2002-8 Elektromagnetische Verträglichkeit
EMV Teil 6-1 Fachgrundnorm Störfestigkeit

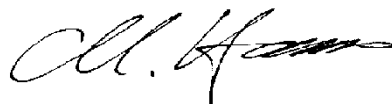
und den angezogenen Prüfberichten übereinstimmt und damit den Bestimmungen entspricht.
and the taken test reports and therefore corresponds to the regulations of the Directive
et les rapports d'essais notifiés et, ainsi, correspond aux règlement de la Directive.

Otterfing, 04.06.2012

Martin Kraus



KMT Kraus Messtechnik GmbH
D-83624 Otterfing - Gewerbering 9
Tel. 08024-48737 Fax 08024-5532
www.kmt-telemetry.com



Ort und Datum der Ausstellung
Place and Date of Issua
Lieu et date d'établissement

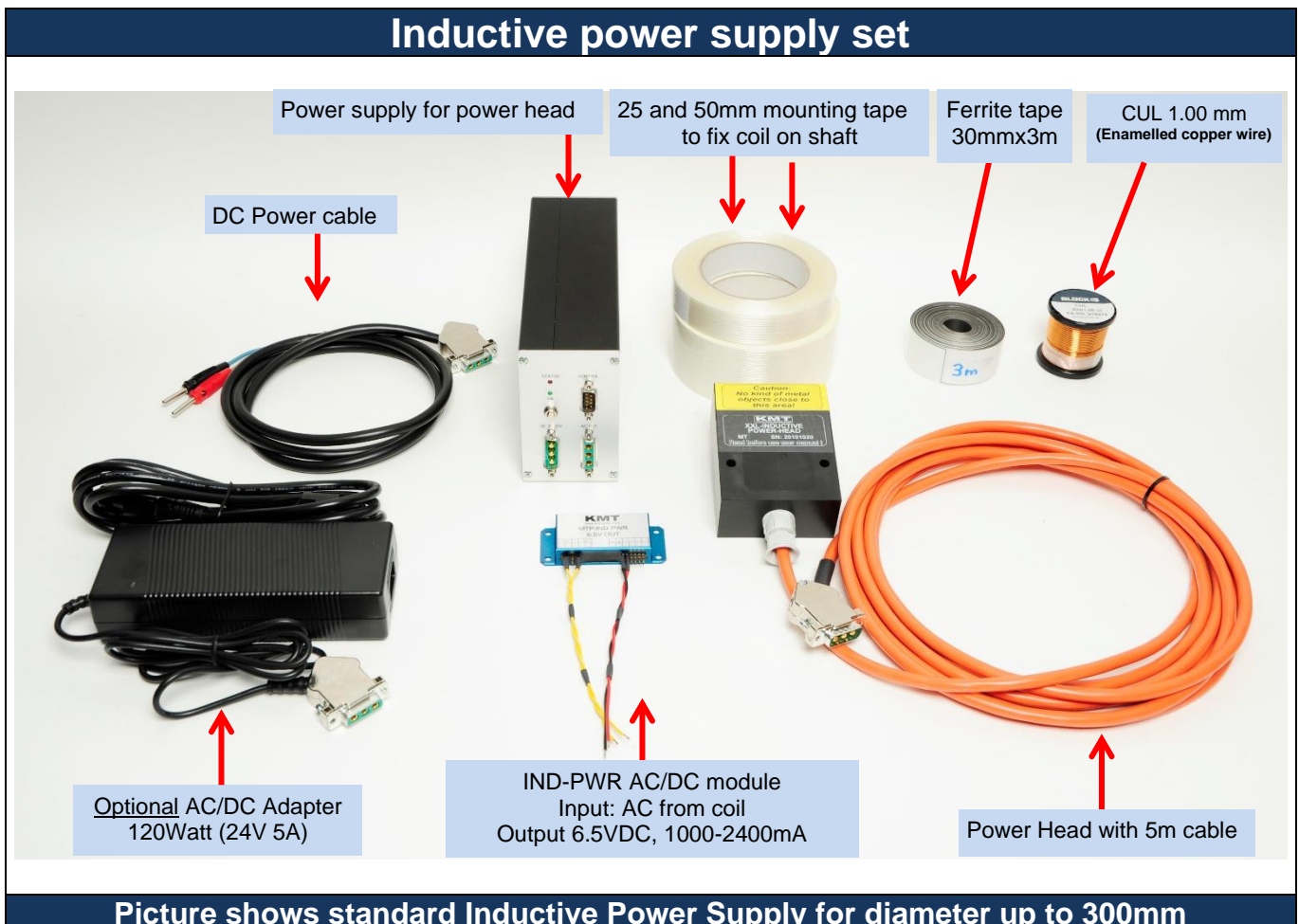
Name und Unterschrift des Befugten
Name and Signature of authorized person
Nom et signature de la personne autorisée

MTP

INDUCTIVE POWER XL, XXL and XXXL

with flat COIL

User Manual

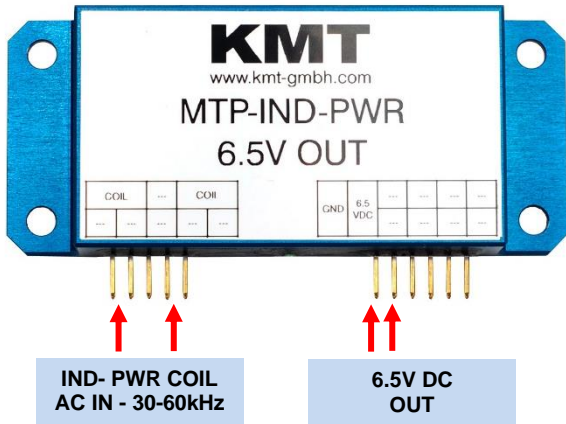


INSTRUCTIONS FOR QUALIFIED PERSONNEL ONLY!

Safety notes for inductive powering

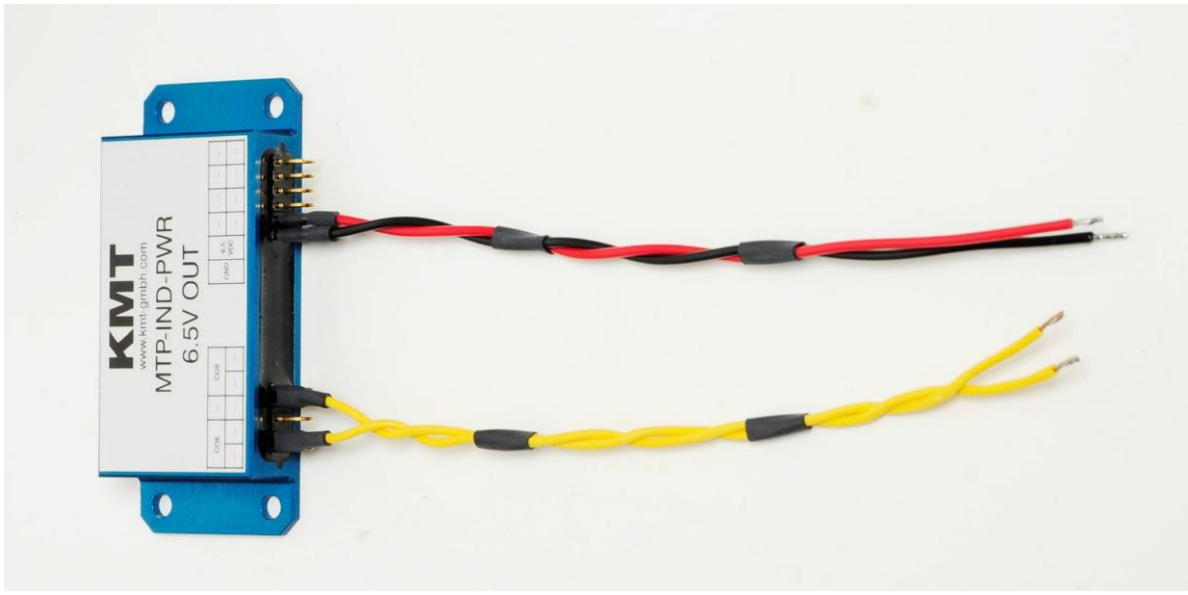
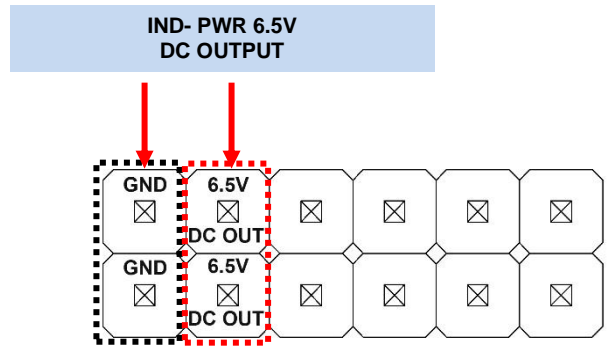
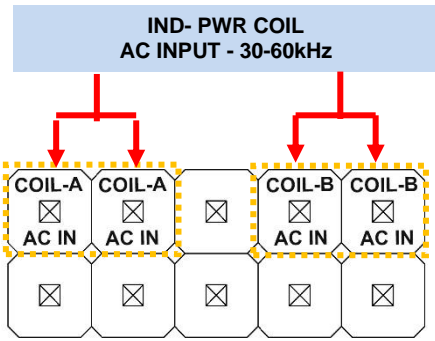
- The device should only be applied by instructed personnel.
- The power head emits strong magnetic radiation at 30-60 kHz to a distance of 300 mm. Therefore persons with cardiac **pacemakers** should **not work** with this device!
- Magnetic data storage media should be kept in a distance of at least 3m from the power head to avoid data loss. The same is valid for electromagnetic sensitive parts, devices and systems.
- Do **not place** the power head in the switched-on state **on metallic objects**, because this results in eddy currents which could overload the device and strongly heat up small objects. Also the probe could be destroyed!
- No metallic objects, other than the disc-type coil, should be located in the air gap of the power head. The same applies to metallic parts within a radius of up to 50 mm in all directions.
- Do not use damaged or faulty cables!
- Never touch in the area between shaft and inductive head, the rotating shaft itself or rotor electronic contacts during operation!
- This is a "Class A" system suitable for operation in a laboratory or industrial environment. The system can cause electromagnetic interferences when used in residential areas or environments. In this case the operator is responsible for establishing protective procedures.

**MTP-IND-PWR - AC/DC Module for inductive
OLD power V01...03 = version until 9/2015**



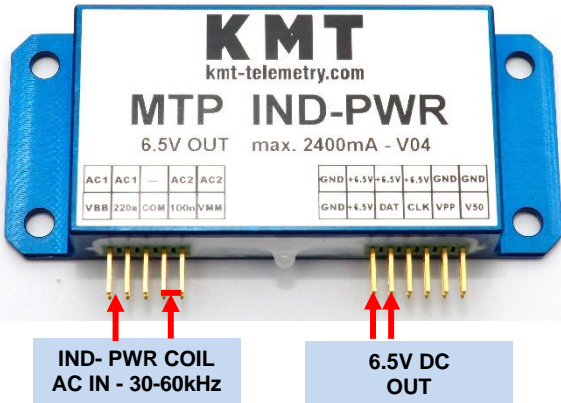
MTP-IND-PWR (V01..03)
 AC/DC Module for inductive power
 Input: 30-60kHz 10-60V AC
Can also power with DC 24V (Input on COIL / COIL)
 Output: 6.5 DC
 Current: up to 2400mA
 Weight: 60 gram
 Vibration: 5g
 Shock: 3000g

Control pin assignment



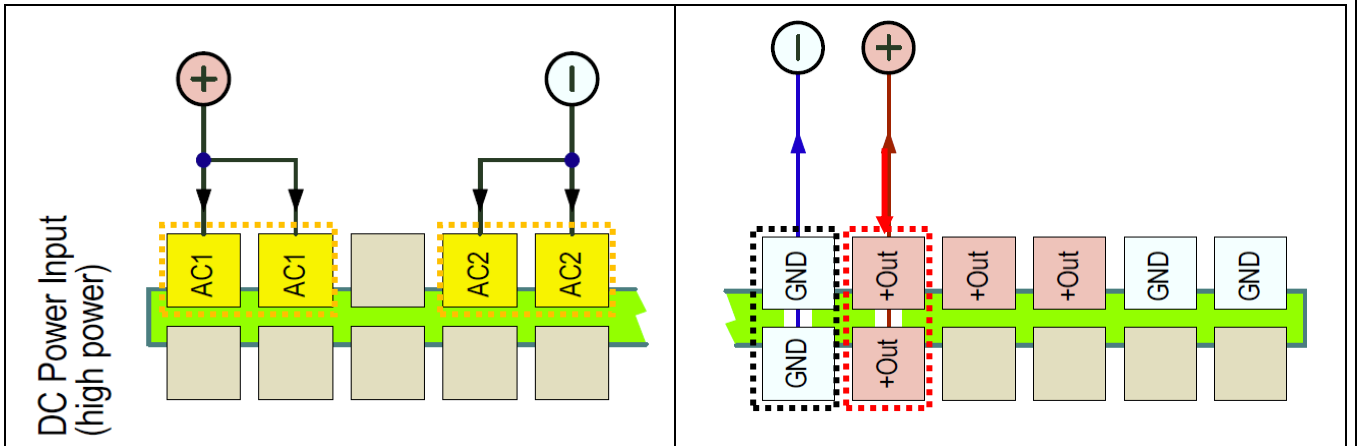
MTP-IND-PWR - AC/DC Module for inductive power

NEW version from 9/2015

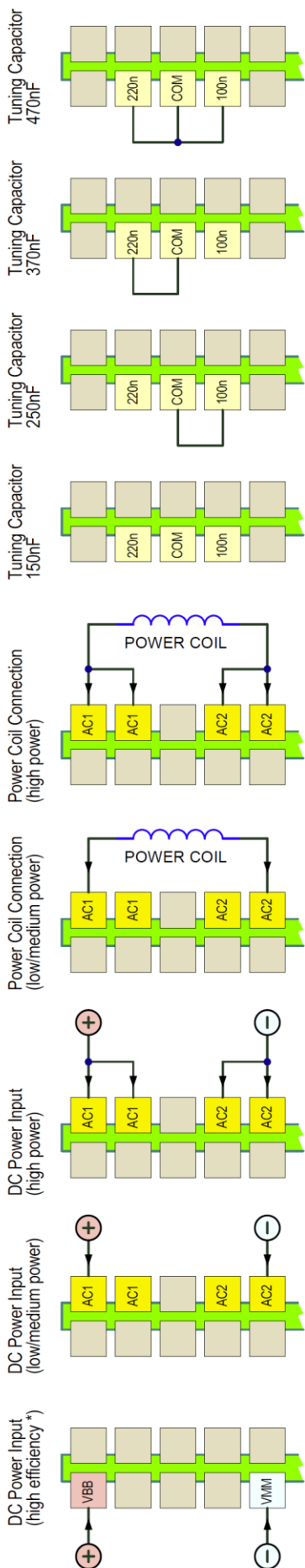


MTP-IND-PWR (V04....)
 AC/DC Module for inductive power
 Input: 30-60kHz 10-60V AC
 Can also be power with **DC 24V** (Input on AC1 / AC2)
 Output: 6.5 DC
 Current: up to 2400mA
 Weight: 60 gram
 Vibration: 5g
 Shock: 3000g

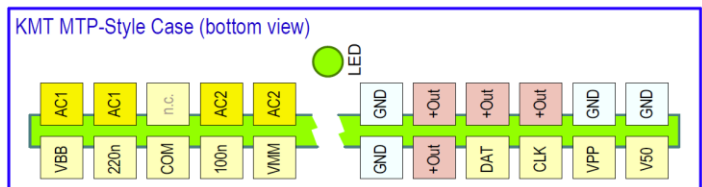
pin assignment (recommend) for up to 2.4A output 6.5V DC



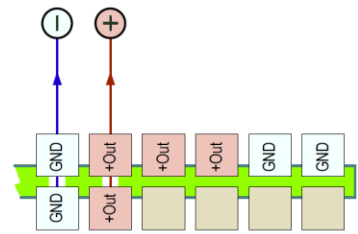
PWR1 Connection Overview



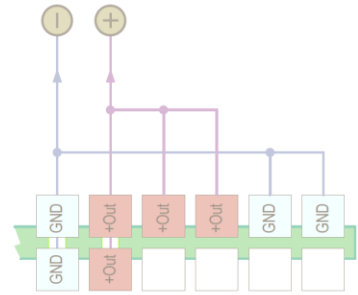
* limited reverse polarity protection



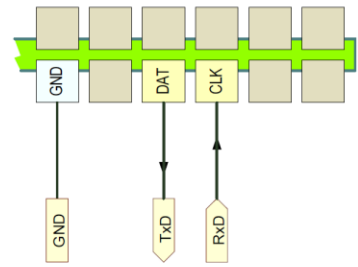
DC Output
@ solder connection
full output current range
@ socket connection
output current <= 1A



DC Output
@ socket connection
output current > 1A

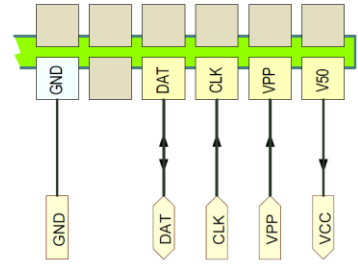


Communication (to/from controller)

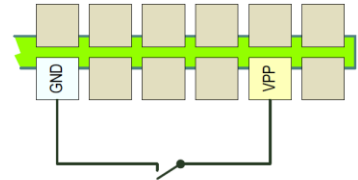


RS232 = TTL Level

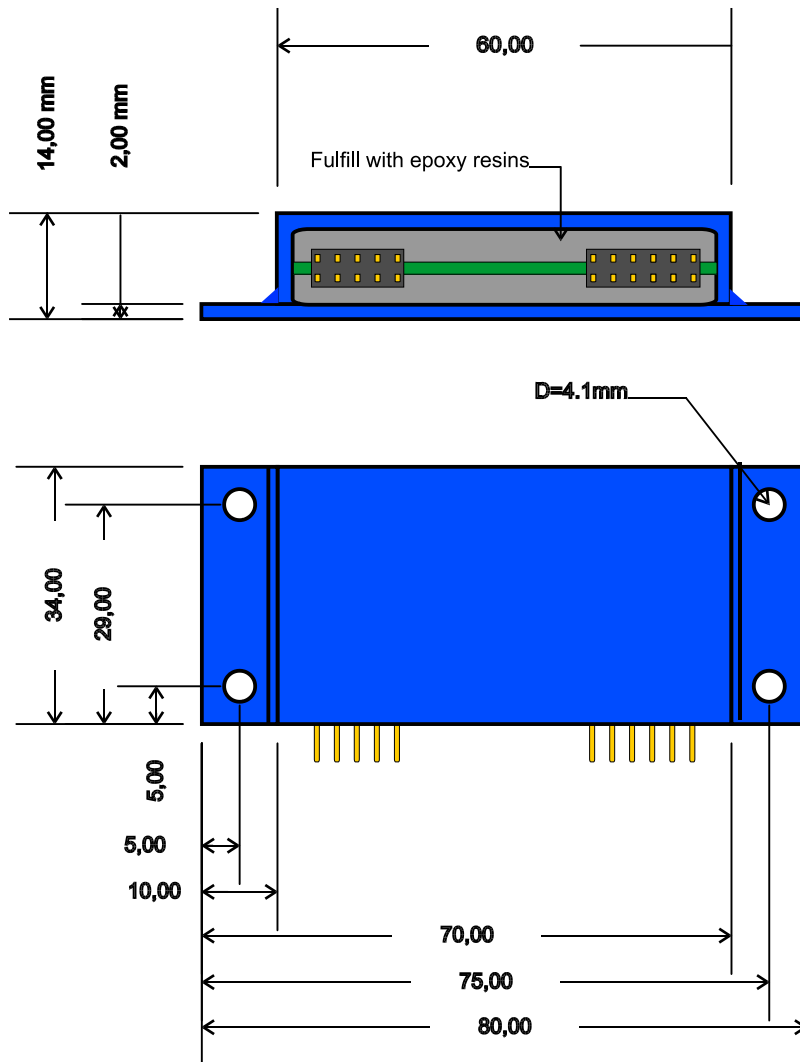
Firmware Update (PIC programmer)



Standby Switch (switch or NPN)

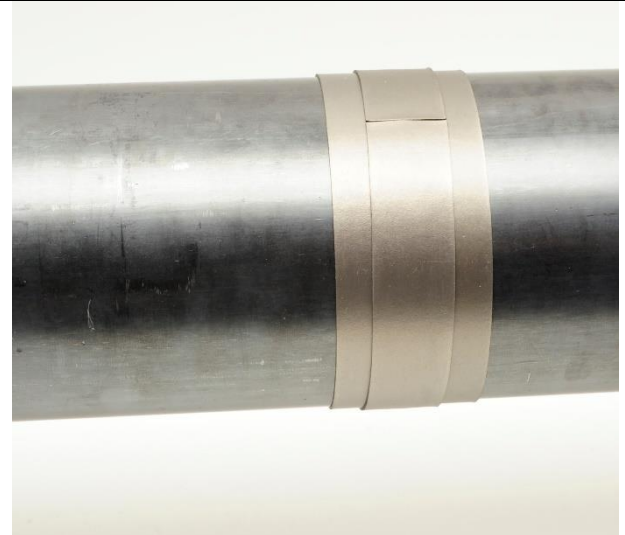
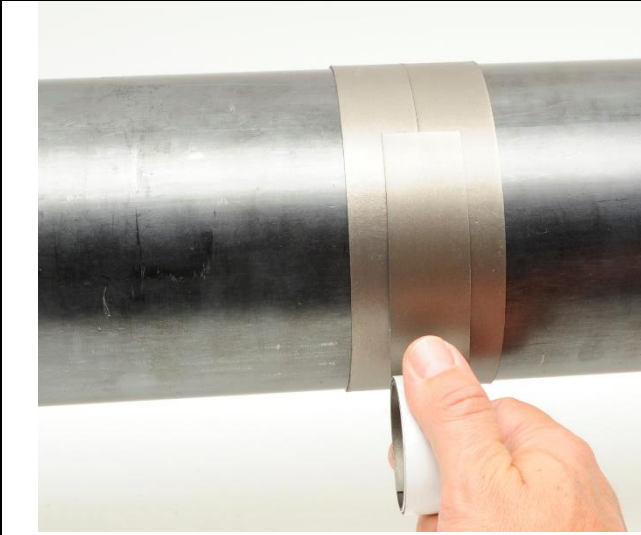


MTP module housing - dimensions

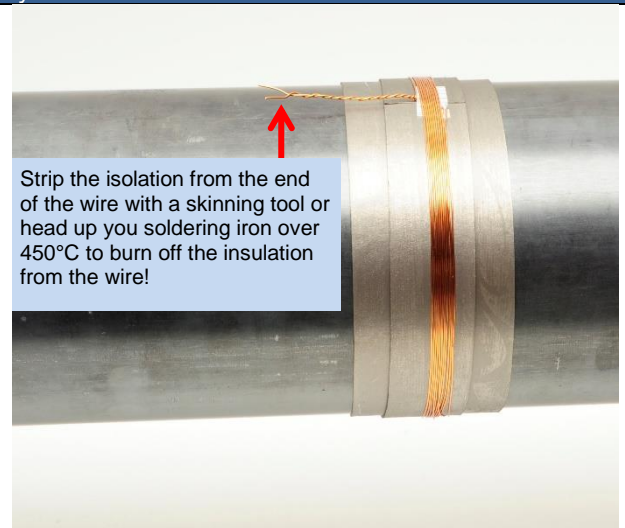
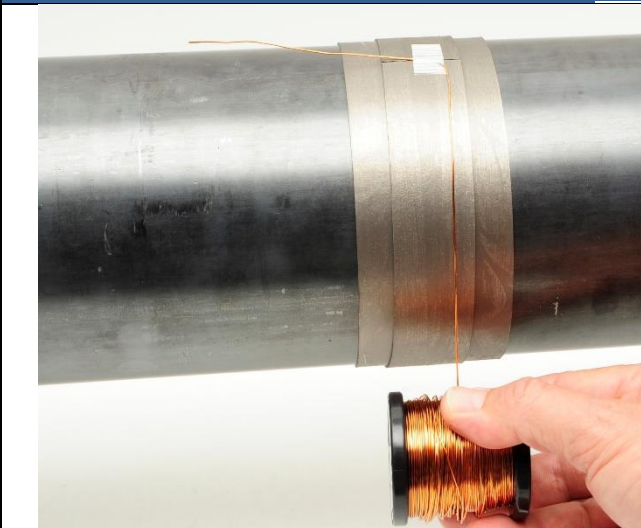


Weight about 60 grams

MTP-inductive power supply Installation of coil for inductive powering on shaft

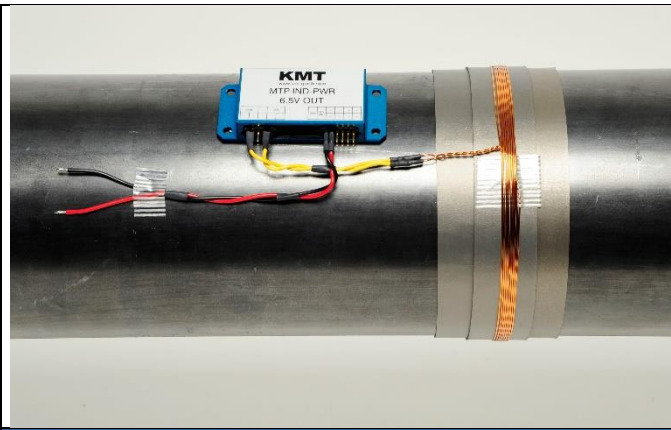


Attach for electromagnetic isolation "Ferrite Tape" 2x parallel and 1x in the middle over two layer around the shaft

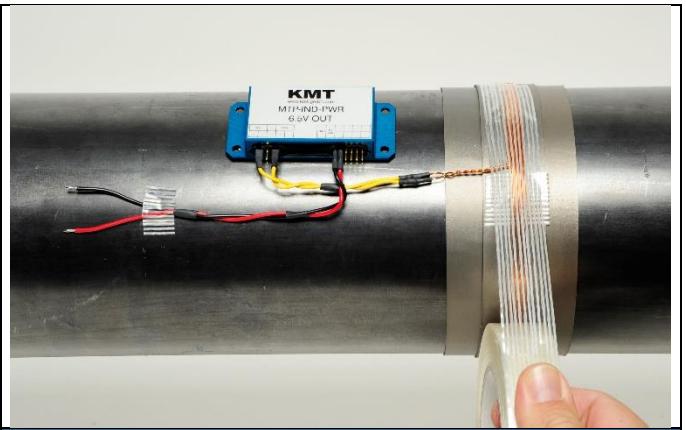


Strip the isolation from the end of the wire with a skinning tool or head up you soldering iron over 450°C to burn off the insulation from the wire!

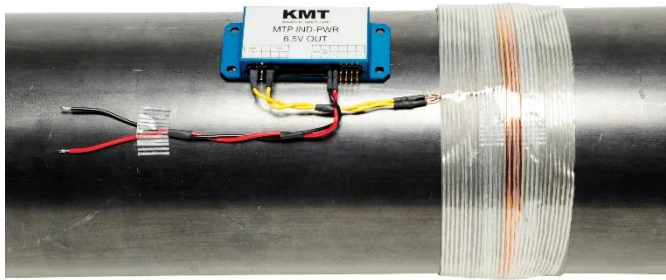
Make power coil with 3-18 windings for 1000-20mm diameter (see diagram) and twisted the end of wire.
Use 0.63...1.00 mm (1.00mm for diameter of 100-1000mm) CUL wire (Enamelled copper wire)



Solder the end of the wire on the AC IN of the IND-PWR module and isolate all solder points with shrink tubing.

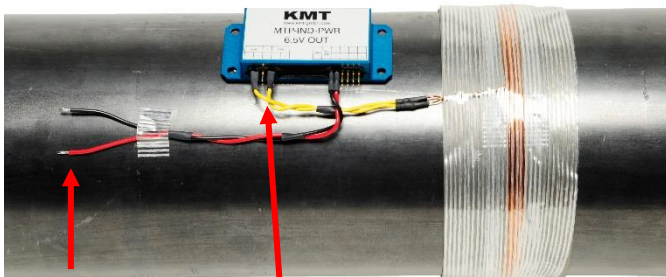


Fixed with 3 layers mounting tape



Note: "The inductive load of the MTP- IND-PWR and the capacitor in the Power Head must be in resonance to get the optimal transmission. The inductive load of the shaft depends of diameters, material and number of windings!

Control the output voltage and move the power-head in the max distance to the coil.
The output voltage must be 6.5 V!



6.5 DC OUT
max. 2400mA

AC IN



The pins "Coil" are the AC power input from the coil. On the pins "+6.5" and "GND" you get a stabilized output voltage of 6.5V DC.

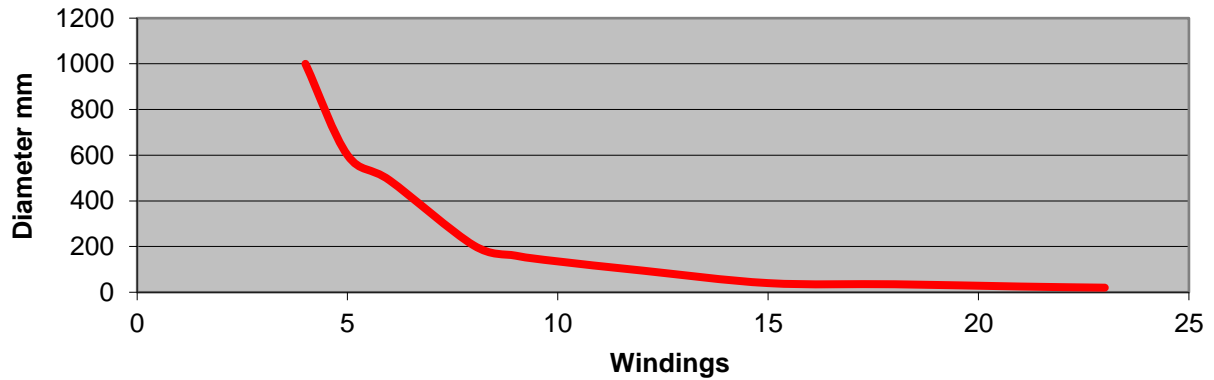
The max. load current on the DC output is 2400mA. The IND-PWR converter will use instead battery pack!
Never use any battery together with the MTP-IndPwr!

You should mount the power head at a fixed location that it's as free as possible from vibration influences.

The center of the coil should be in the same horizontal position as the center of the power head. The distance is optimal in the range between 5 and 10mm. (depends of shaft and current consumption)

Find the correct amount of windings of inductive power coil

Optimum windings for steel shafts



Missing turns occasionally can be compensated by increasing the tuning capacity from 150nF up to 470nF

Windings (+/-1)	nF	Diameter (mm)
4	250nF	1000
5	150nF	600
6	150nF	490
8	150nF	205
9	150nF	160
10	150nF	135
12	150nF	95
15	150nF	40
18	150nF	35
21	150nF	25
23	150nF	20

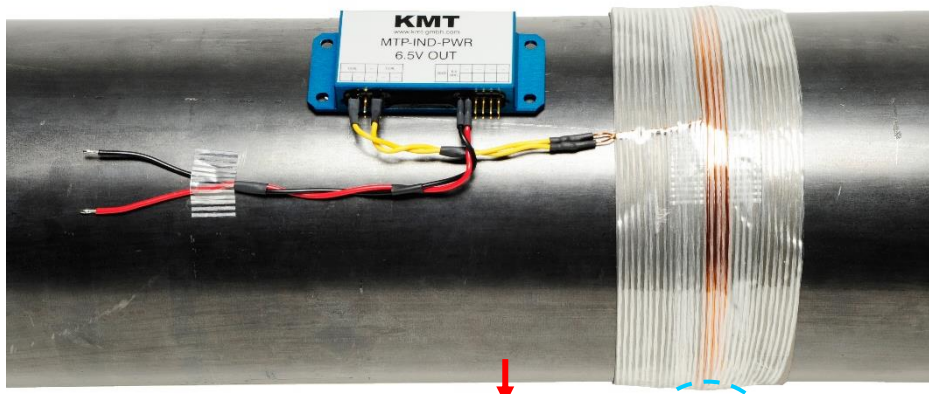
Tuning Capacitor
150nF

Tuning Capacitor
250nF

Tuning Capacitor
370nF

Tuning Capacitor
470nF

KMT MTP-Style Case (bottom view)



Distance 5-15mm

Magnetic field



Distance dependent of current consumption e.g. 2000mA at 5-10mm, 500mA at 10-15mm

Recommend power heads:

Diameter:	150mm	300mm	500mm	1000mm
4 - Channel	XL	XL	XL	XXL
8 - Channel	XL	XL	XXL	XXXL
16 - Channel	XL	XXL	XXXL	XXXL
32 - Channel	XXL	XXXL	XXXL	On request

IND-PWR-HEAD-XL and XXL

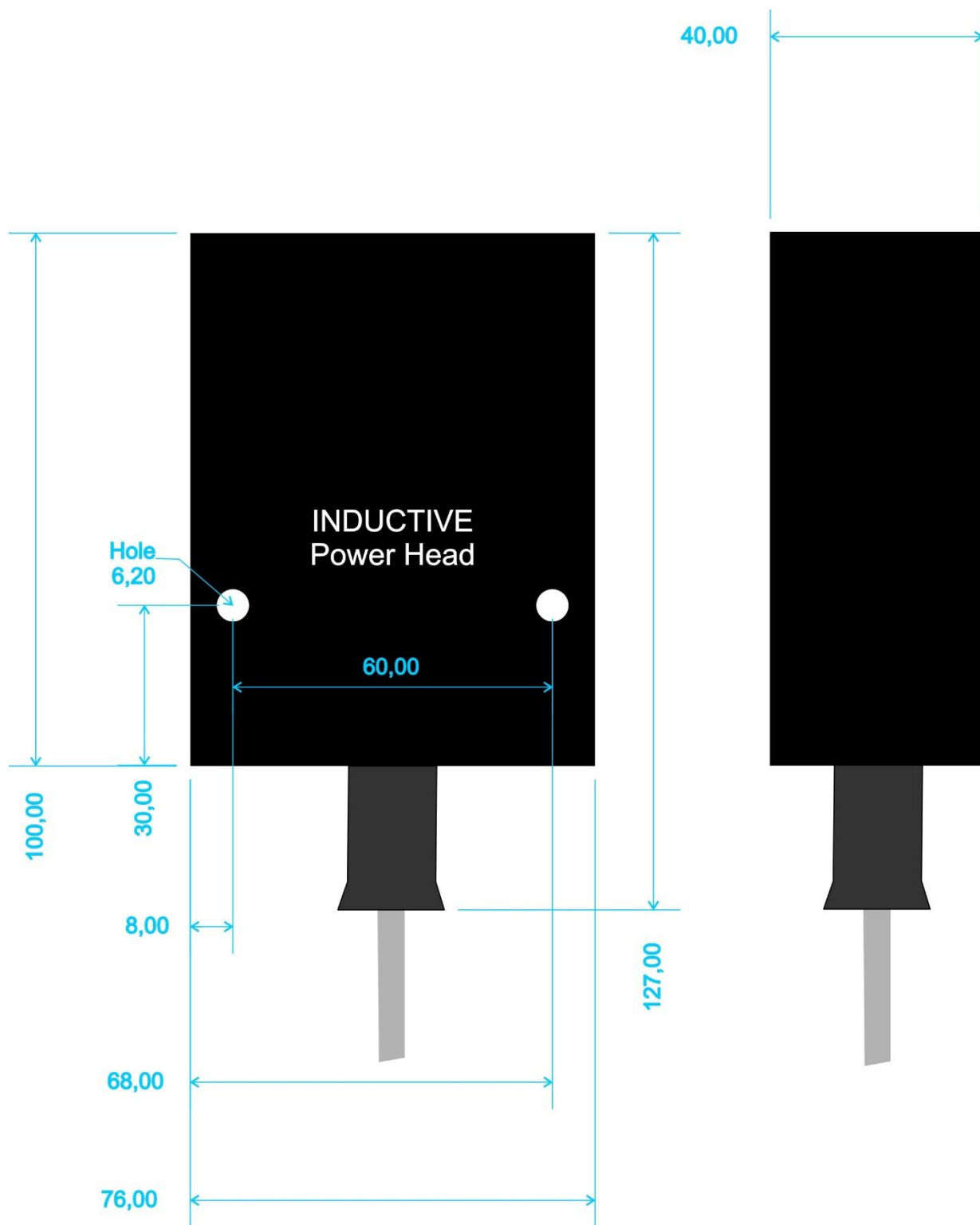


IND-PWR-HEAD-XXXL

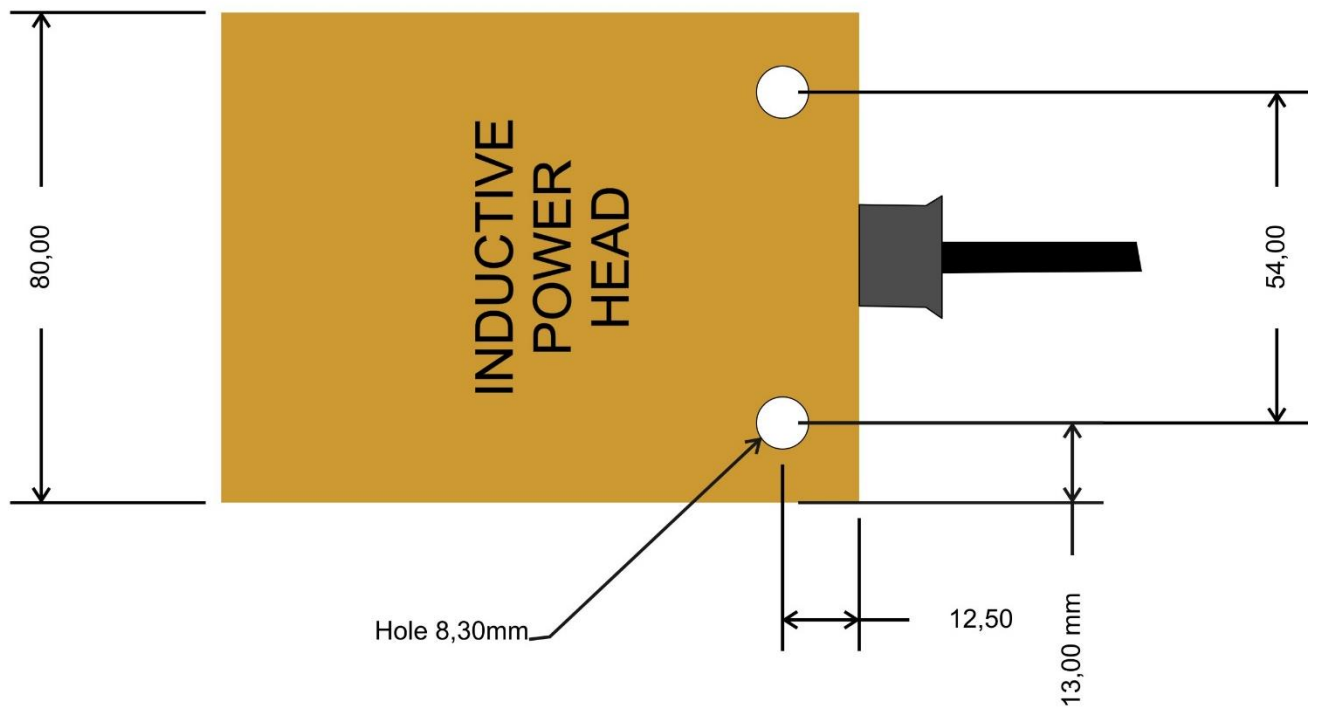
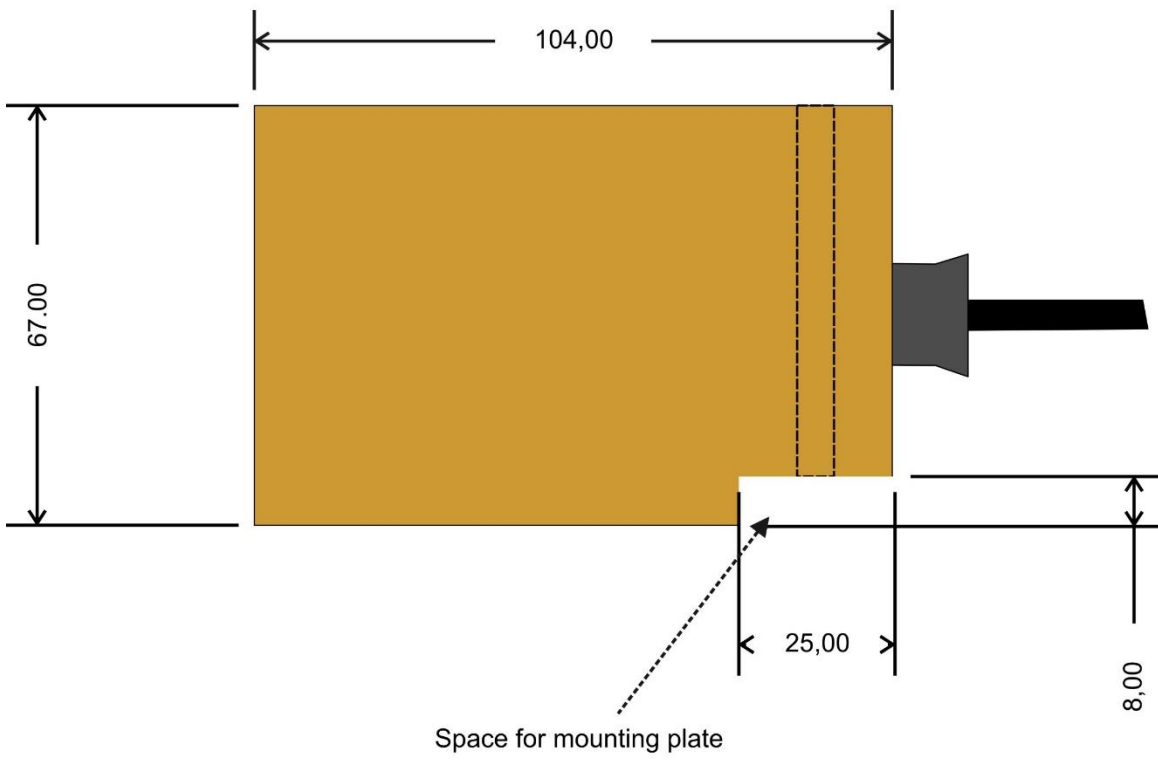


**Caution for use of XXL and XXXL power heads!
Cable must unrolled for use, otherwise it will warm up!**

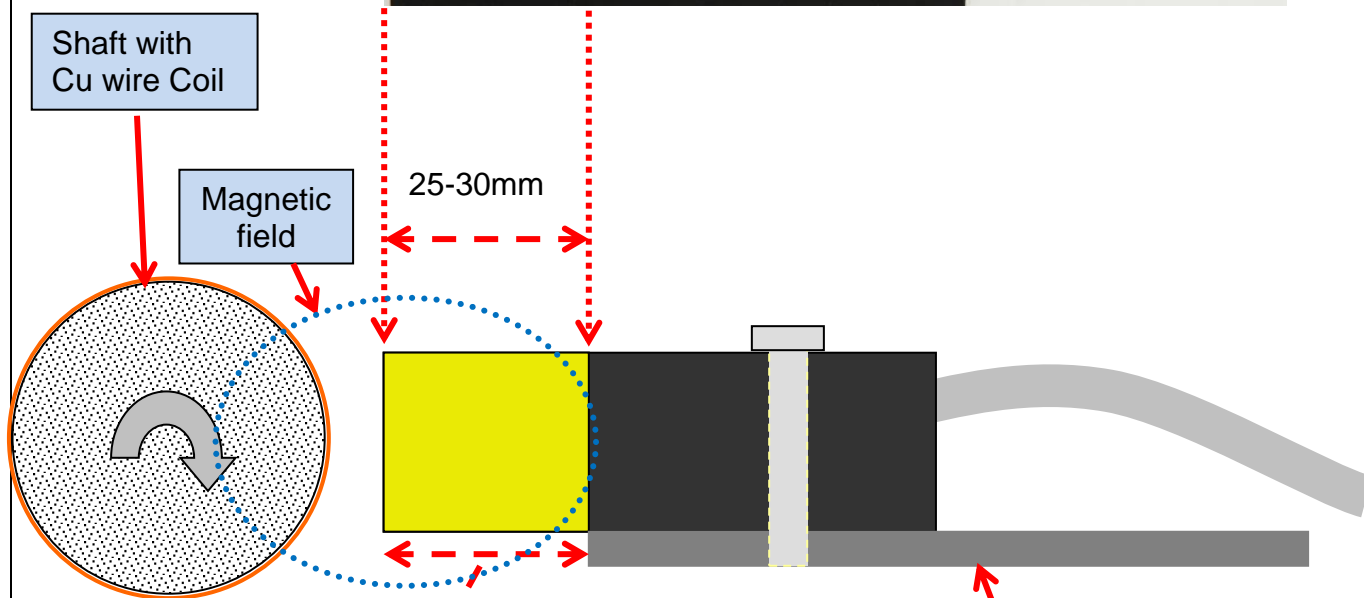
Dimensions of IND-PWR-HEAD- XL and XXL



Dimensions of IND-PWR-HEAD-XXXL

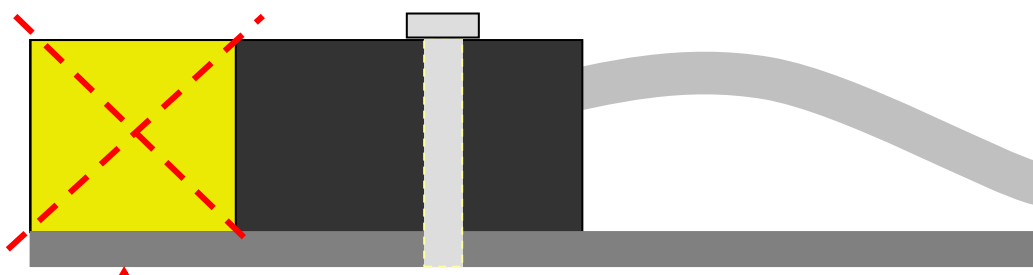


Following must be considered at the mounting of the inductive power head



Don't use for mounting any kind metal in this area (25-30mm)! Otherwise magnetic energy will flow in the metal and decrease the distance between power head and coil (on shaft)!

Example of mounting



Wrong!!! Mounting (only if metal) plate cover the active area of

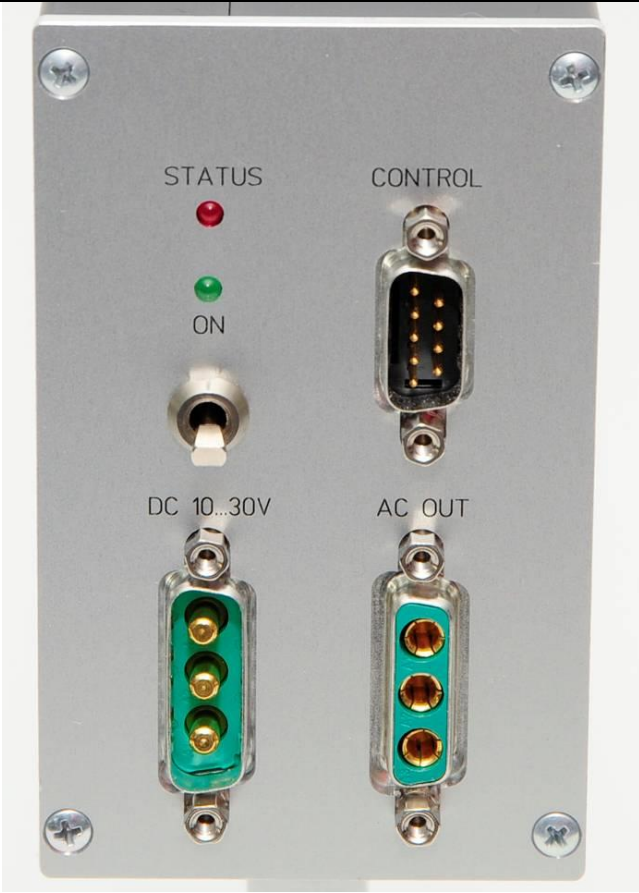
Technical data



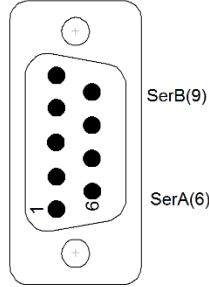
Power output:	AC 25-35kHz for power head L, XL, XXL and XXXL
Power input:	10-30 V DC, typical 24V
Power consumption	<100 Watt, depends of power head
Dimensions:	205 x 105 x 65mm
Weight:	1.275 kg
Environmental	
Operating:	-20 ... +70°C
Humidity:	20 ... 80% not condensing
Vibration:	5g Mil Standard
Static acceleration:	10g in all directions
Shock:	50g in all directions

MTP-IND-PWR-XXL

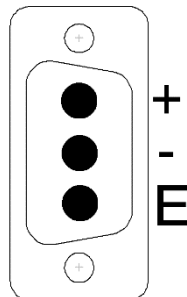
Pin connection



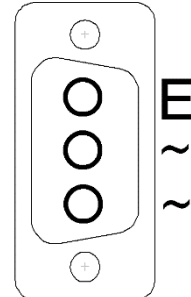
RS 485



CONTROL - Not used!



DC 10-30V
typical 24V
(up to 100 WATT*)



AC 25-35kHz output
power head

*** deepens of power head)**

E= have no function

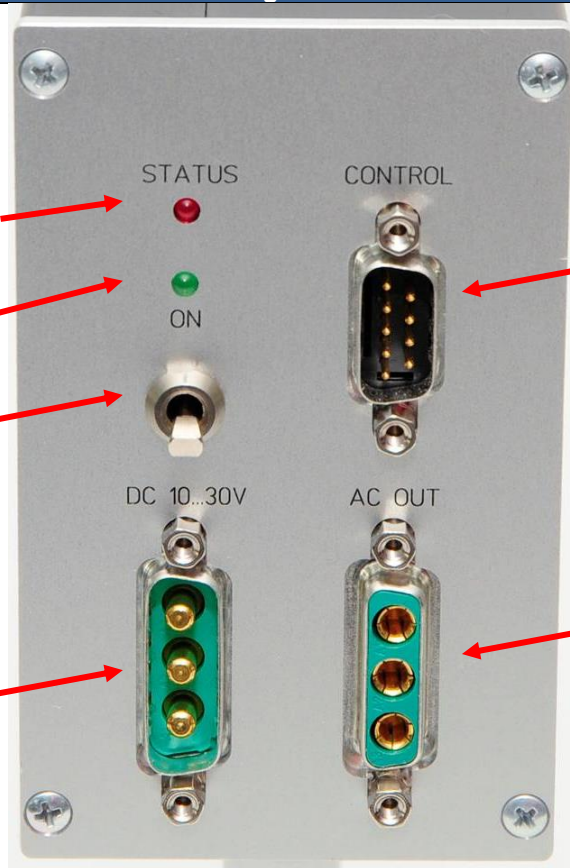
Powering and AC out

LED flashing = auto adjustment
LED ON = finish
ON= Inductive resonance freq.
of power head reached!
Can take up to 20sec.!

Power control LED

Power Switch

Power INPUT
DC 10-30V
typical 24V
(up to 100WATT*)



Control out of function

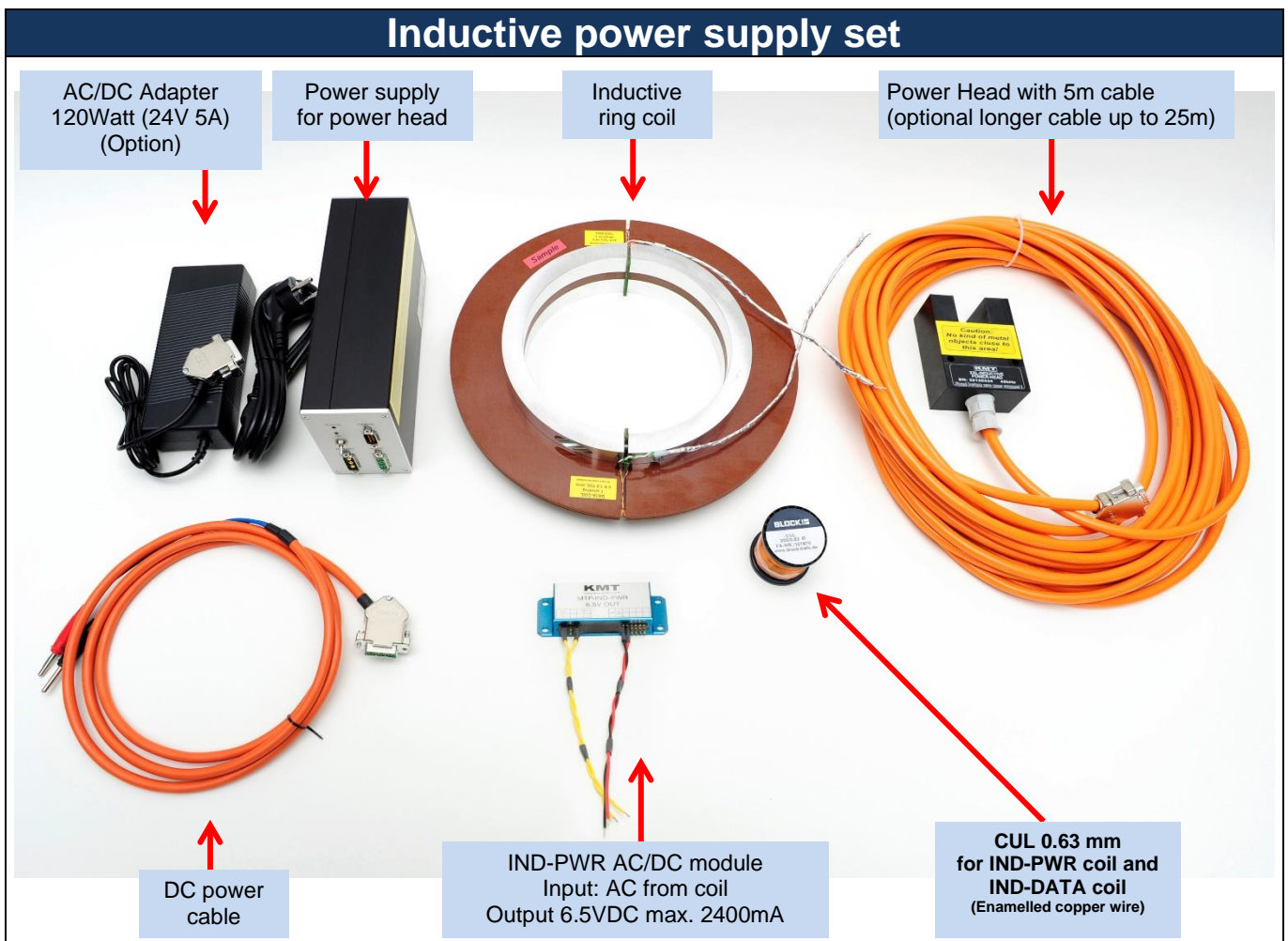
AC 25-35kHz output
for power head

MTP

INDUCTIVE POWER

with RING COIL

User Manual

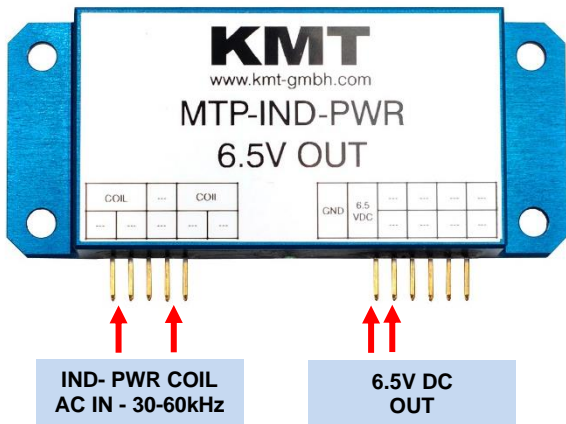


INSTRUCTIONS FOR QUALIFIED PERSONNEL ONLY!

Safety notes for inductive powering

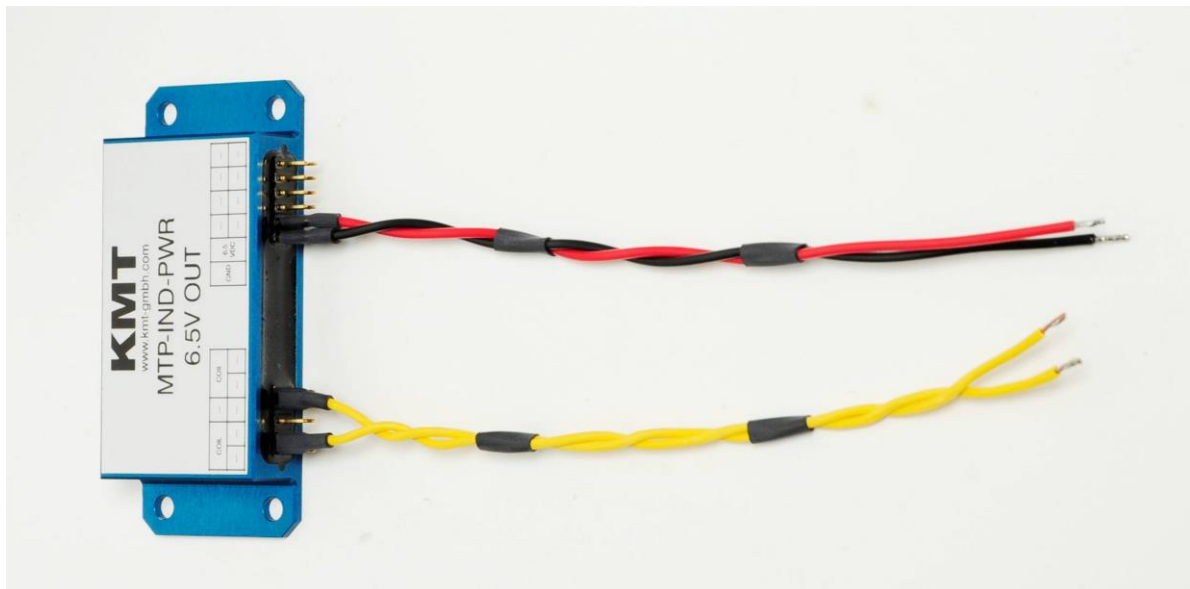
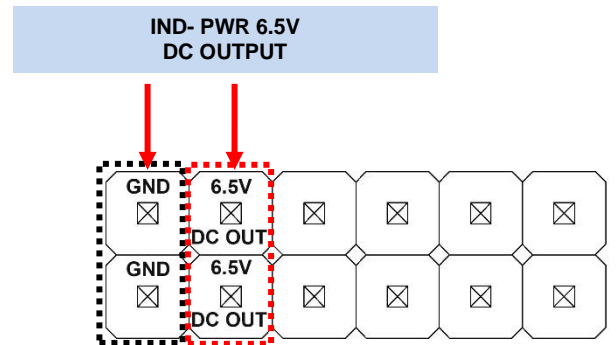
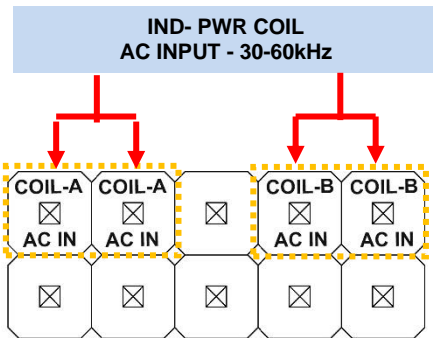
- The device should only be applied by instructed personnel.
- The power head emits strong magnetic radiation at 30-60 kHz to a distance of 300 mm. Therefore persons with cardiac **pacemakers** should **not work** with this device!
- Magnetic data storage media should be kept in a distance of at least 3m from the power head to avoid data loss. The same is valid for electromagnetic sensitive parts, devices and systems.
- Do **not place** the power head in the switched-on state **on metallic objects**, because this results in eddy currents which could overload the device and strongly heat up small objects. Also the probe could be destroyed!
- No metallic objects, other than the disc-type coil, should be located in the air gap of the power head. The same applies to metallic parts within a radius of up to 50 mm in all directions.
- Do not use damaged or faulty cables!
- Never touch in the area between shaft and inductive head, the rotating shaft itself or rotor electronic contacts during operation!
- This is a "Class A" system suitable for operation in a laboratory or industrial environment. The system can cause electromagnetic interferences when used in residential areas or environments. In this case the operator is responsible for establishing protective procedures.

MTP-IND-PWR - AC/DC Module for inductive power V01...03 = version until 9/2015

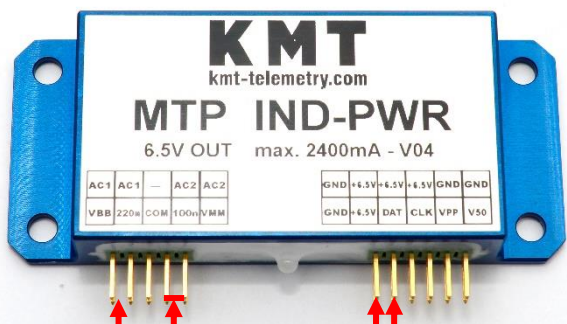


MTP-IND-PWR
 AC/DC Module for inductive power
 Input: 30-60kHz 10-60V AC
Can also be power with DC 12-24V (Input on COIL / COIL)
 Output: 6.5 DC
 Current: up to 2400mA
 Weight: 60 gram
 Vibration: 5g
 Shock: 3000g

Control pin assignment



MTP-IND-PWR - AC/DC Module for inductive power (new version from 9/2015 ...)



IND- PWR COIL
AC IN - 30-60kHz

6.5V DC
OUT

MTP-IND-PWR (V04...)

AC/DC Module for inductive power

Input: 30-60kHz 10-60V AC

Can also be power with DC 24V (Input on AC1 / AC2)

Output: 6.5 DC

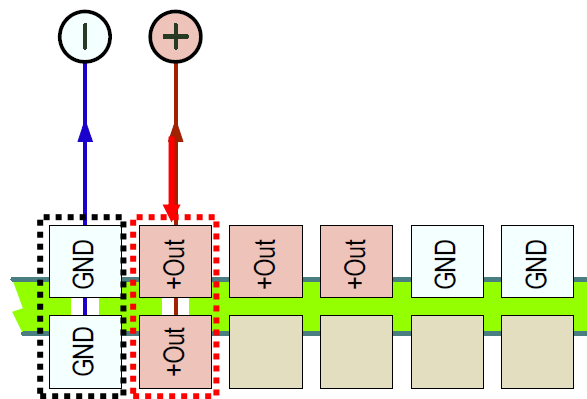
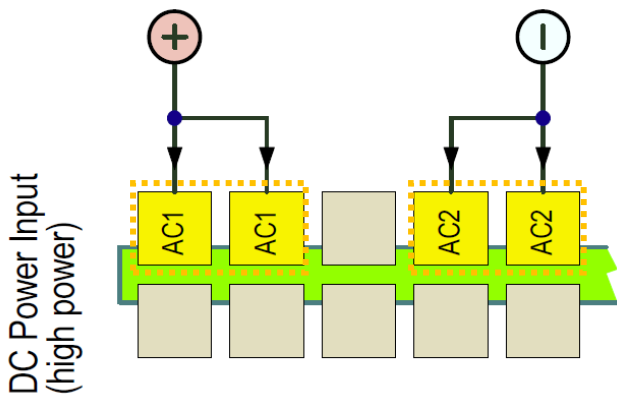
Current: up to 2400mA

Weight: 60 gram

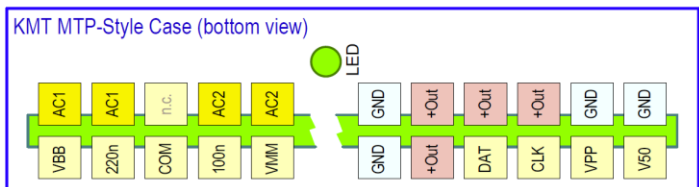
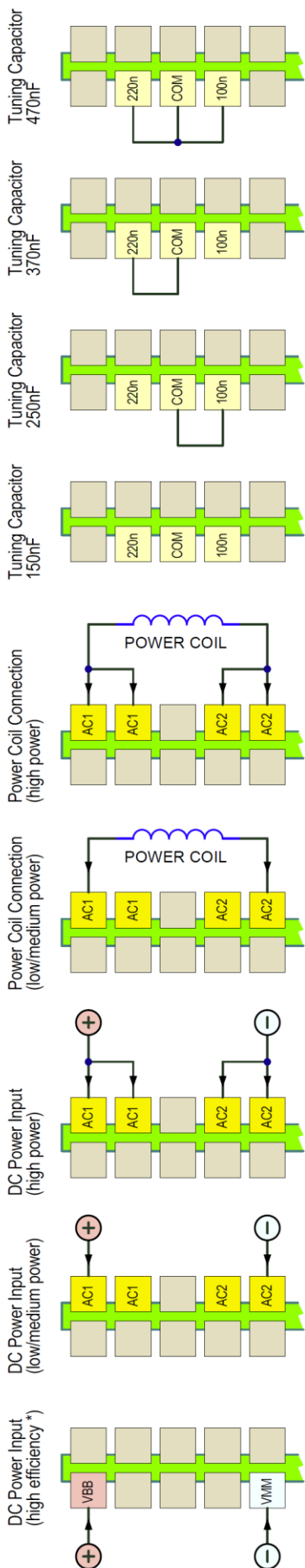
Vibration: 5g

Shock: 3000g

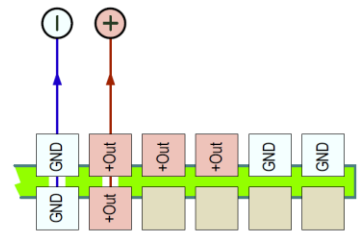
pin assignment (recommend) for up to 2.4A output 6.5V DC



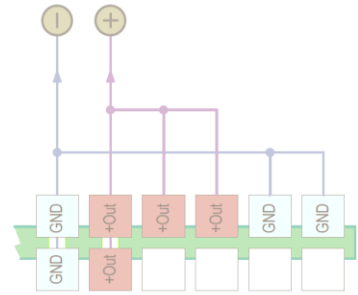
PWR1 Connection Overview



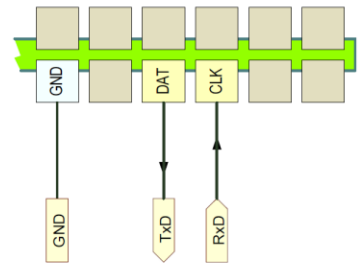
DC Output
 @ solder connection
 full output current range
 @ socket connection
 output current <= 1A



DC Output
 @ socket connection
 output current > 1A

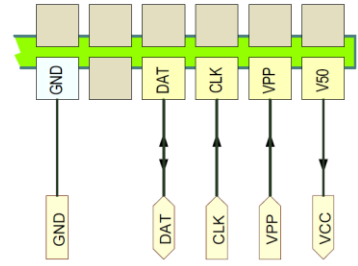


Communication (to/from controller)

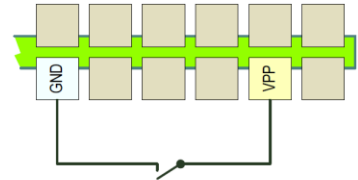


RS232 = TTL Level

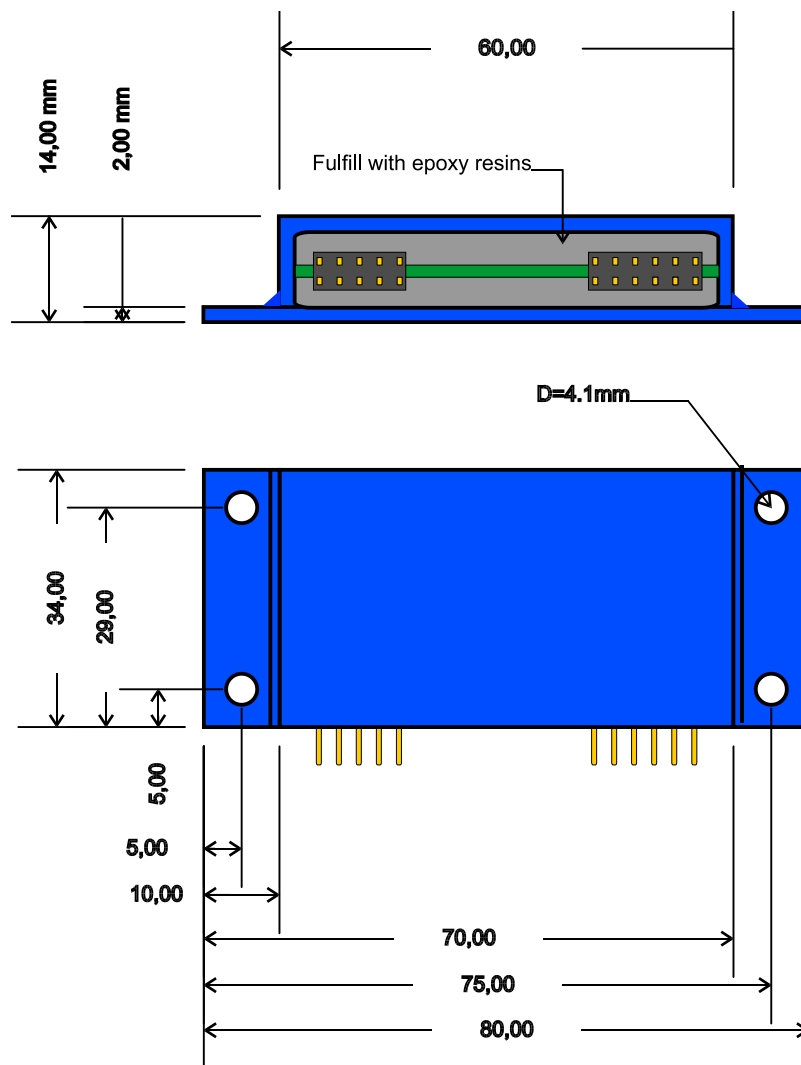
Firmware Update (PIC programmer)



Standby Switch (switch or NPN)

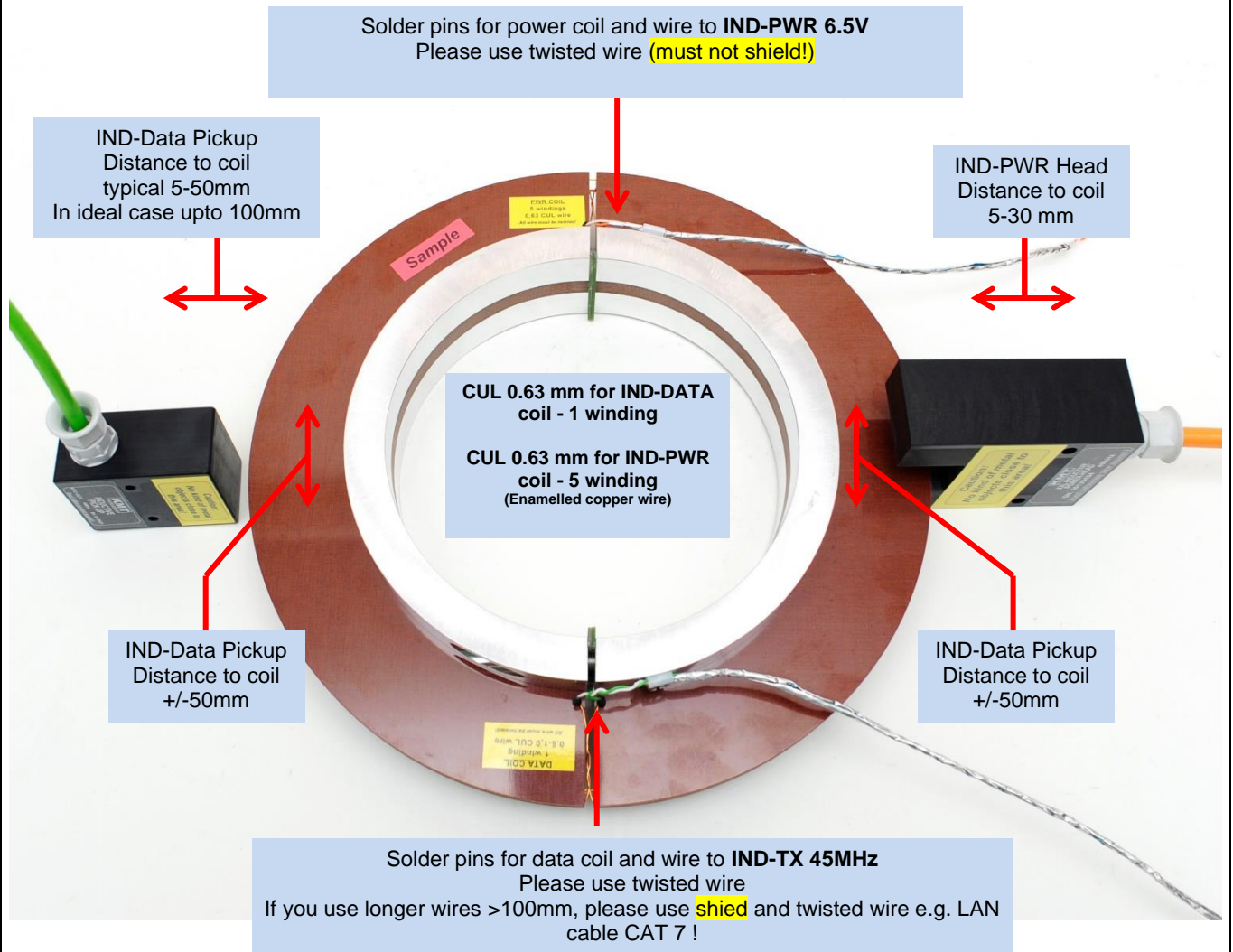


MTP-IND-PWR housing - dimensions



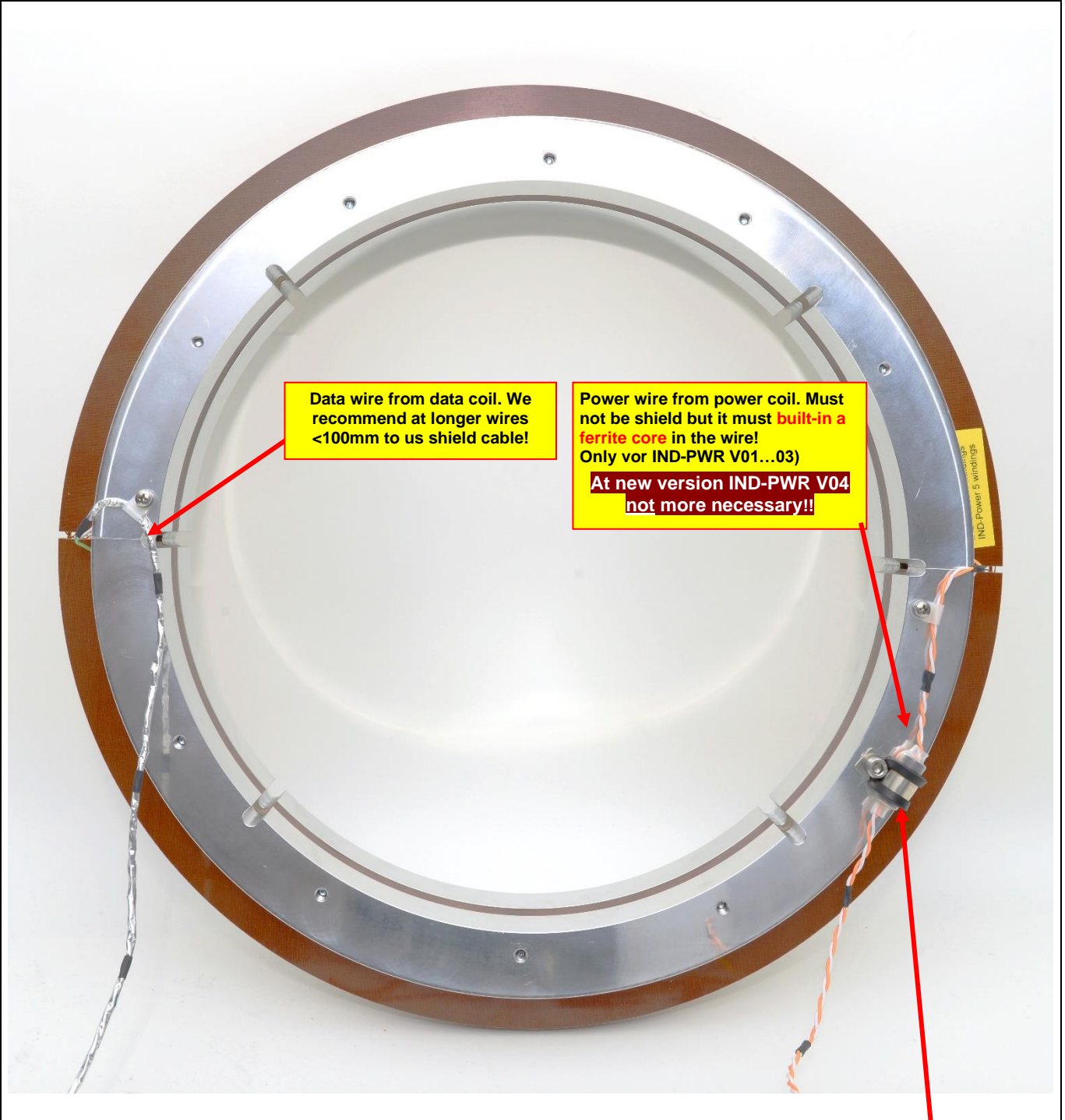
Weight about 60 grams

Inductive power supply RING COIL - Distance power head and pickup head



Data cable CAT. 7A S/FTP 4P AWG22 (= solid bare copper wire **0.64mm**-diameter) recommend
or
Data cable CAT. 7 S/FTP 4P AWG23 (= solid bare copper wire 0.55mm-diameter)


RING COIL – uncouple the 45MHz frequency from inductive data coil with ferrite core filter to reach better transmitting range!



Data wire from data coil. We recommend at longer wires <100mm to us shield cable!

Power wire from power coil. Must not be shield but it must **built-in a ferrite core** in the wire!
Only vor IND-PWR V01...03)
At new version IND-PWR V04 not more necessary!!

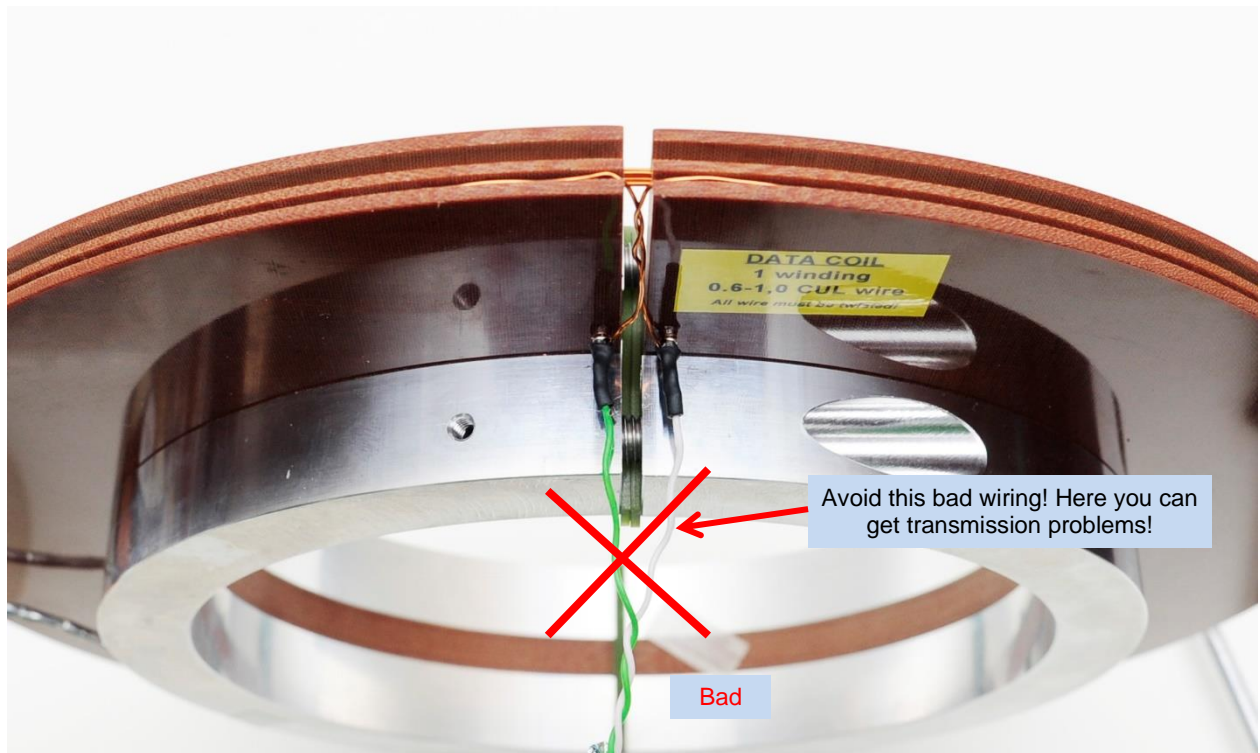
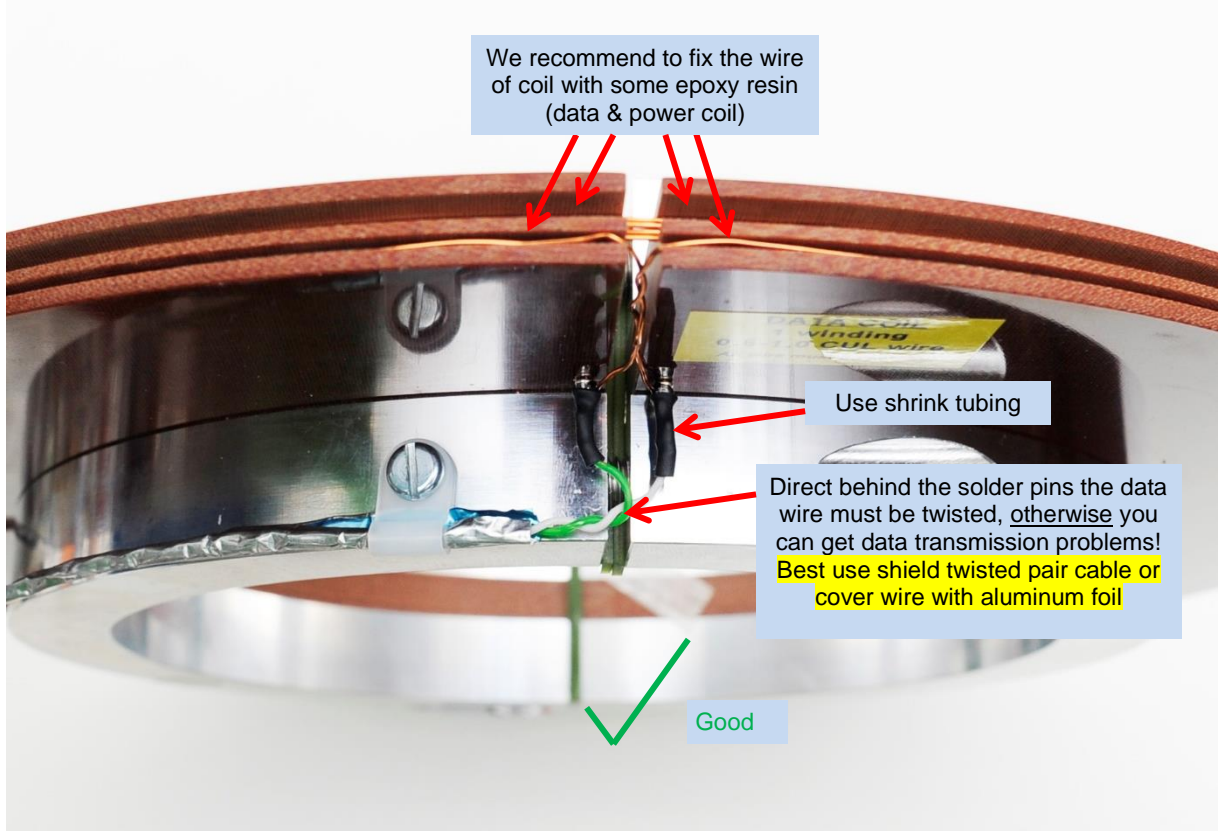
Use a ferrite core and make 2 loops with the twisted pair cable through the core!



Normal is this ferrite core a part of the delivery at RING Coil version from KMT!!

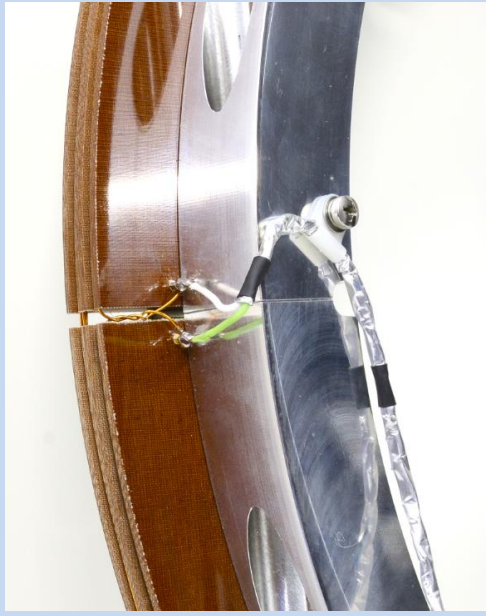
At new version IND-PWR V04 not more necessary!!

Inductive power supply RING COIL – wire connection



Inductive power supply RING COIL – Distance power head

DATA-COIL
1 winding with
CUL wire 0.63mm
(Enamelled copper wire)



PWR-COIL
5 winding with
CUL wire 0.63mm
(Enamelled copper wire)

Windings depends of diameter!!
See label on RING Coil



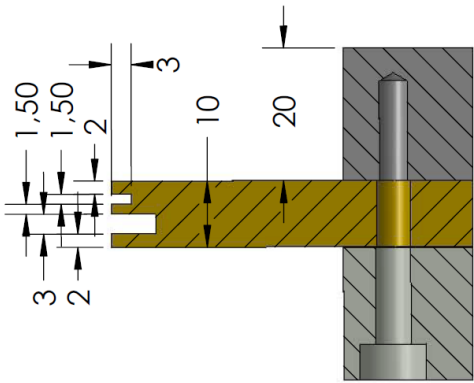
Distance 5-30mm

Distance
+/-9mm

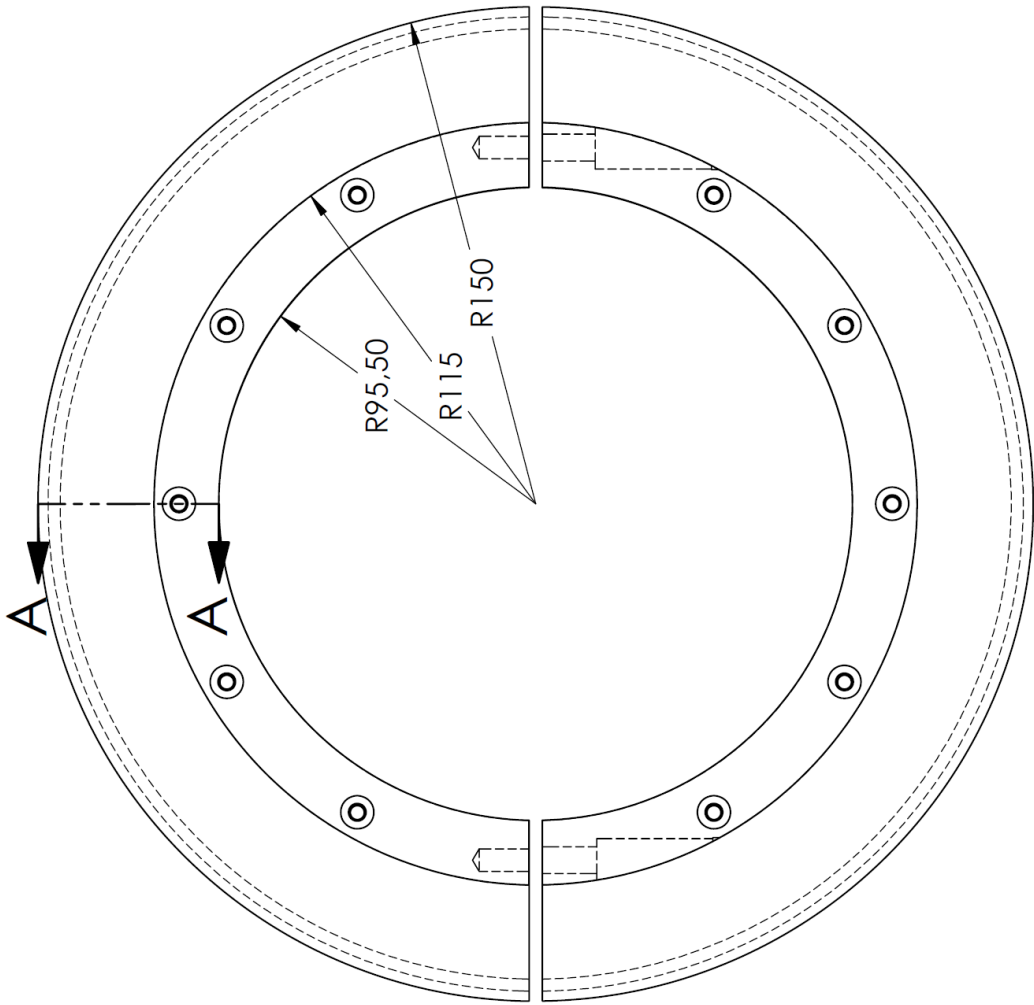
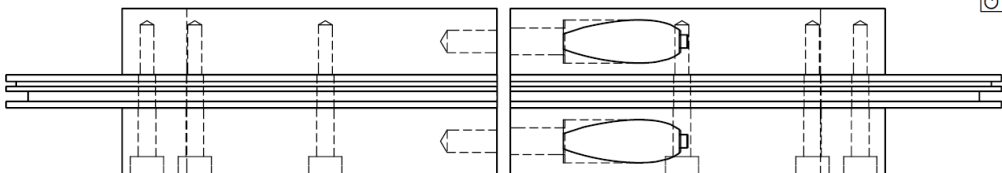
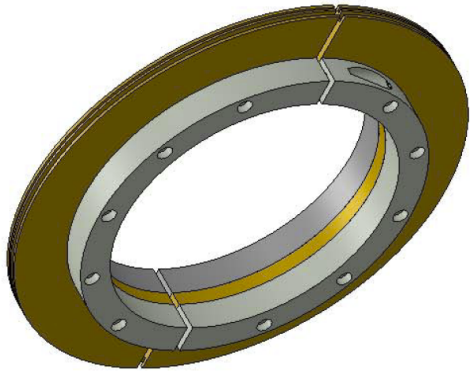
Caution:
No kind of metal
objects close to
this area

XKL-INDUCTIVE
POWER-HEAD
SN: 20110355
Read before use user manual !

Inductive power supply
Example of a RING COIL with inner diameter 191mm

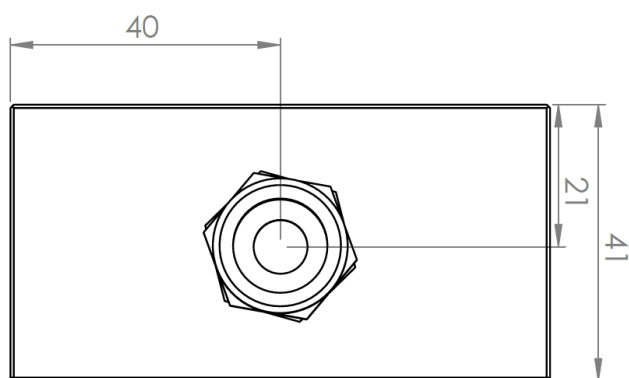
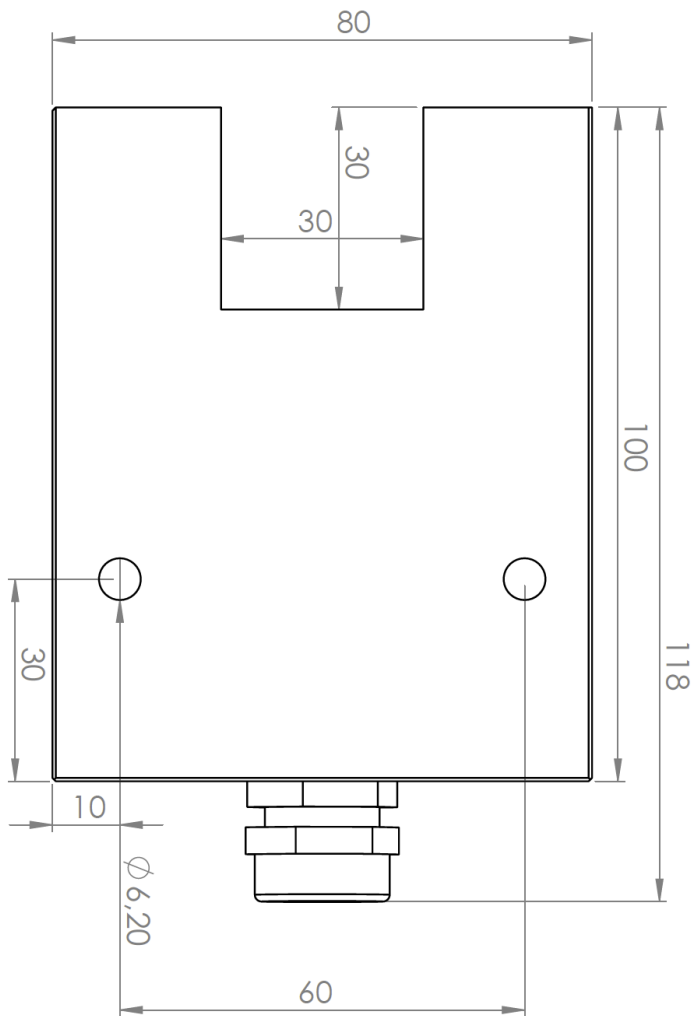
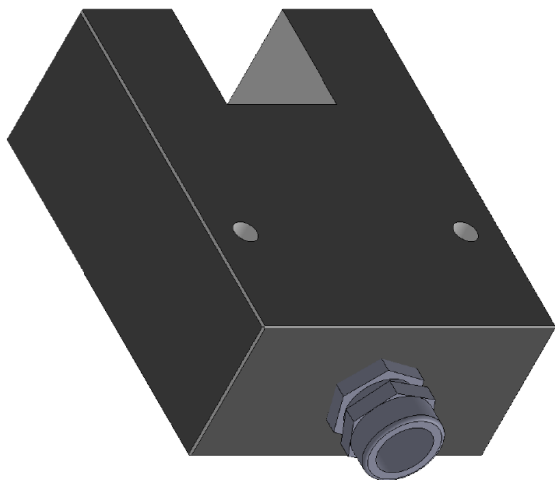


SCHNITT A-A
 MASSSTAB 1 : 1



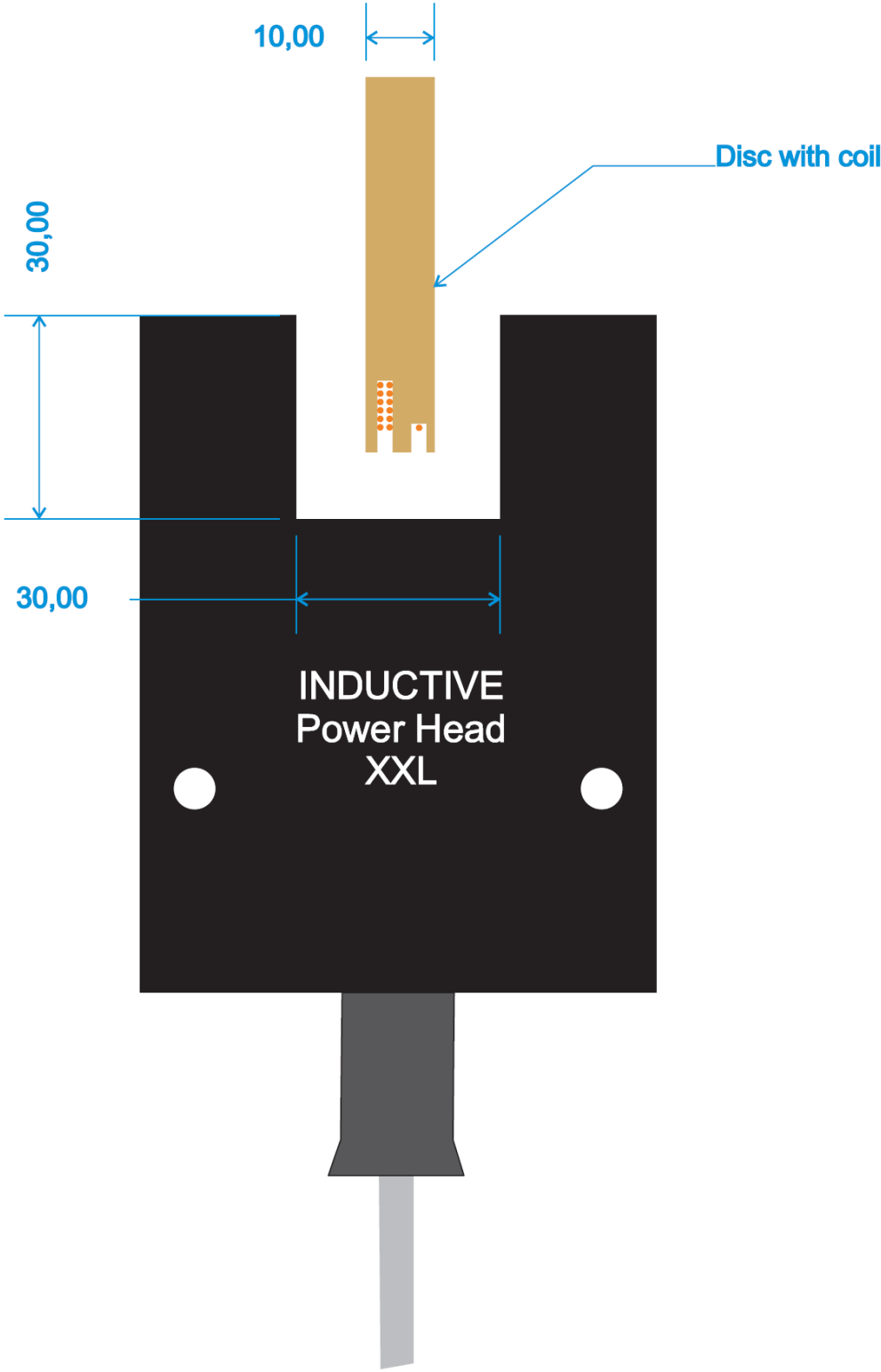
GRÖSSE ZEICHNUNGSNR.	ÄND.
A	Ring191B
MASSSTAB: 1:5	BLATT 1 VON 1

Dimensions of IND-PWR-HEAD-XXL



Date	Version	Mat:
10.10.2016		
Remarks:		Bl: A4
Scale		Weight-gr: 376.66
1:1		Part:
		PH-XXL-Schlitz-bg
TELEMETRY		hu
KMT		Email: info@kmt-gmbh.com
		Tel: 08024-48737, Fax: 08024-5532

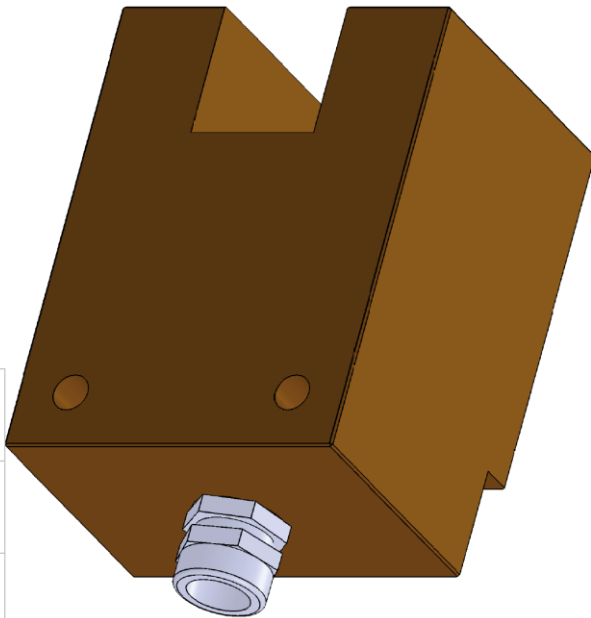
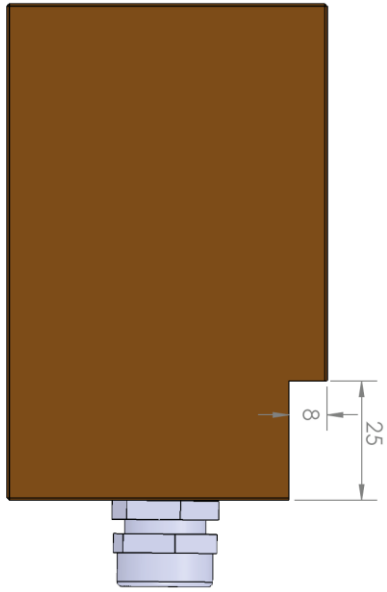
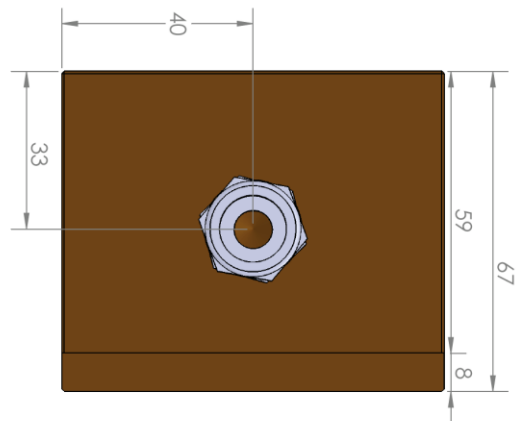
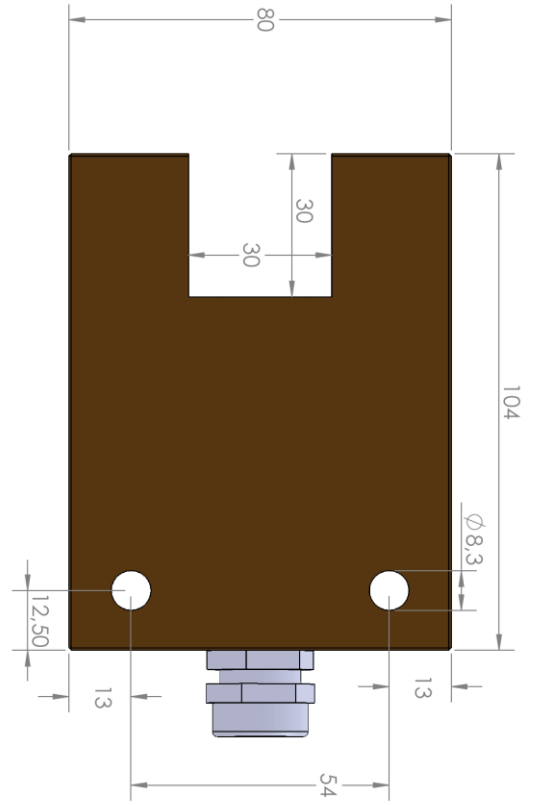
INDUCTIVE POWER HEAD XXL
Coil distances





**Caution for use of power heads!
Cable must unrolled for use, otherwise it will warm up!**

Dimensions of IND-PWR-HEAD-XXXL



Date	Version	Mdjt:
07.09.2016		
Remarks:	Bl: A3	Weight-gr: 614,85
Scale	Part:	
1:1	PU-Pwr-XXXL	
hu	www.kmt-telemetry.com	
	Email: info@kmt-telemetry.com	
	Tel: +49 8024 48737 / Fax: +49 08024 5532	





**Caution for use of power heads!
Cable must unrolled for use, otherwise it will warm up!**